

SUMMER 1977

# Search & Rescue

MAGAZINE

THE OFFICIAL PUBLICATION OF THE NATIONAL ASSOCIATION FOR SEARCH AND RESCUE



Colorado's  
LONGEST VEHICLE  
RESCUE ON RECORD

Bill March on  
GROUND ANCHORS

TORNADO!  
PERILE FROM THE SKY

SALT TABLETS...  
YES OR NO

N.A.S.A.R. NEWS



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# Search & Rescue

## MAGAZINE

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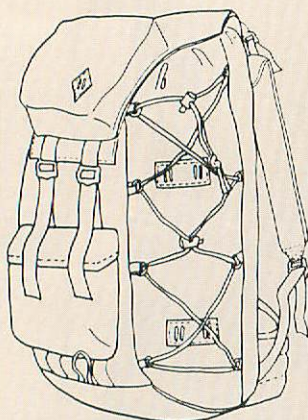


*If only we had known what  
to do when we lost our way?*



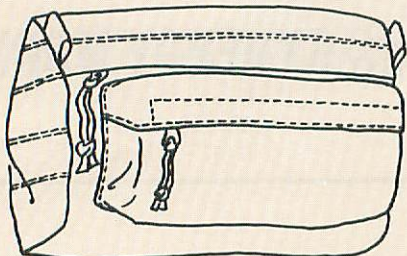


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## LETTERS TO THE EDITOR



Dear Sir:

Congratulations on the continuing success of *Search and Rescue Magazine*. The interesting, informative articles are a credit to your efforts and a source of pride to everyone in the search and rescue field.

The increased amount of advertising evident is also a healthy sign and hopefully will be viewed by readers not as a nuisance but as a vote of confidence from the publishing business's toughest critics—the American businessmen.

However, I believe the full-page advertisement on page 19 of the Winter 1976 issue which urges subscription to *Soldier of Fortune* magazine is not in the best interests of *Search and Rescue Magazine* or the National Association of Search and Rescue.

As you know, a soldier of fortune does not fight for honor, duty or country but simply for profit, adventure or pleasure. Without trying to sound like a preacher in search of a pulpit, let me simply say that these people are not deserving of our respect or support.

I'm sure that the job of finding advertisers is not simple and further, that assessing the worthiness of each product advertised is probably not possible. But in a case such as this, where the values of the advertiser are so clearly in conflict with the humanitarian goals of search and rescue, I believe the advertisement should be rejected.

This is not to say that all soldiers are undeserving of our respect. Career officers and enlisted men for the most part, devote their lives to the service of their country and are honorable men in an honorable profession. Soldiers of fortune have no obligation to honor, they simply serve the highest bidder.

Good luck and keep up the good work!

Thomas F. Nelson  
Search & rescue coordinator

Dear Mr. Nelson:

Does it not seem feasible that the interests of these potential "life-takers" be converted to those of "life-savers"?

Ed.

(Continued on page 8)



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# Ground Anchors

## bill march

In November 1976 at a week long Mountain Rescue Seminar held at Plas-y-Brenin National Mountaineering Centre several days were devoted to the problems of sea cliff rescue and evacuation. It soon became evident that one of the most important considerations was the provision of adequate anchor points in order to effect the rescue. There are a number of factors which have an effect on the choice and type of anchor.

1. The majority of cliff rescues involve landward evacuation and require hoisting techniques which place a far greater strain on anchor points than does lowering.

2. The cliff top surface is often windswept and treeless with a thin cover of soil over deeply weathered and rotten regolith of the bedrock. It is in many cases extremely difficult to utilize the more conventional belaying methods of pitons, chocks or bolts, as there is no exposed bedrock. In addition, natural belays tend to be loose blocks or shattered cracks. Large detached boulders should be treated with suspicion as it is only a few years ago that several members of the Cockermouth Mountain Rescue Team in the English Lake District were killed or injured when a large boulder of several tons weight gave way during a practice stretcher lower.

3. The edge of the cliff is composed of loose soil and boulders which can easily be dislodged by the rescue ropes and fall on the rescuers and casualty below.

In view of these problems a number of different approaches have been tried with some success. Basically there are two types of anchor points available where bedrock is not easily accessible.

The transportable anchor point which by virtue of its size and weight is a secure anchor; e.g., a jeep or helicopter; and the inserted anchor points e.g. the stake board, angle iron, spider and auger which are hammered or screwed into the soil. The transportable belays are excellent and Land Rovers have been used by the British Coast Guard whenever they can drive to the cliff top. In Scotland in the Cairngorm Mountains, British Army Scout helicopters have been used in anchor points on practice rescues off the headwall of large Corries. The flat plateau surface affords a good landing site for the helicopters. There are many places, however where weather, wind conditions or ground slope angles preclude the use of vehicles. In these instances, inserted anchor points are necessary.

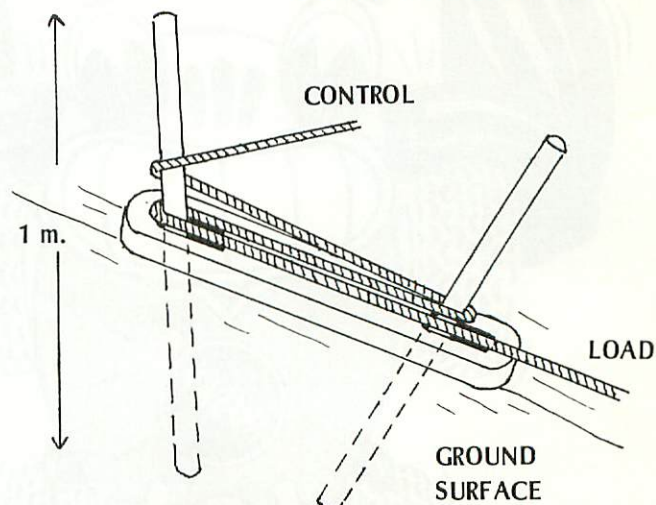
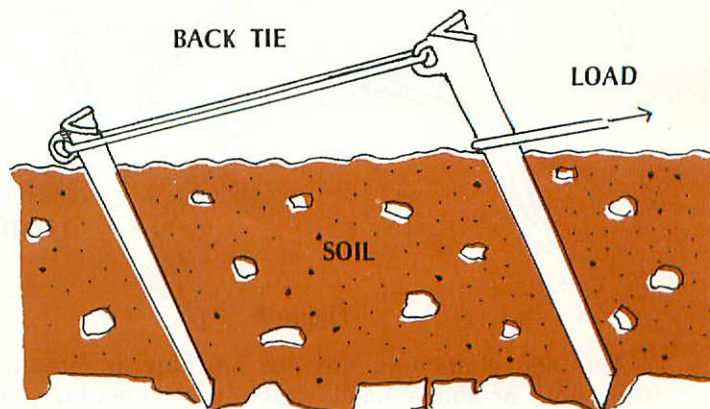


Figure 1

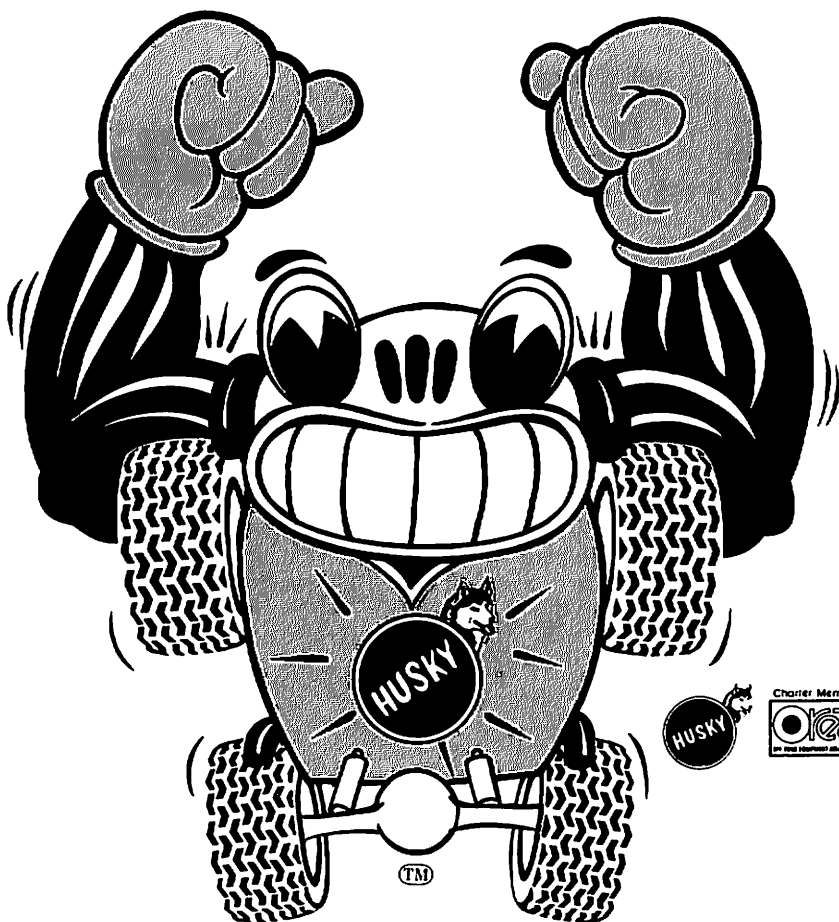
The Stake Board (see Figure 1) is a simple effective method used by the British Coast Guard which is both a secure anchor point as well as a belaying device. It consists of a strong board approximately 1 metre long with a two inch diameter hole at each end. Metal rods are hammered in at an angle slightly off the vertical, sloping outwards in a V formation. The belaying rope is looped around and in and out the two rods to form a friction brake which can easily be locked off by multiple looping or cleating (e.g., tying a half hitch). This method has much to commend it, in that it is simple and easy to control. The size of the device allows a knotted rope to pass through with little difficulty, an advantage on long lowers where ropes may have to be joined together. The conventional method is to use large angle iron stakes (see Figure 2) hammered into the soil, the front one tied back to the rear stake from the top as an additional reinforcement. A third tie back stake may be added if it is thought necessary. Both the stake board and the angle iron require



(Continued on next page)

Figure 2





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## GROUND ANCHORS, *continued*

deep firm soil for secure placement.

The Spider (see Figure 3) is used in the Peak District for belaying on heather moorland in peat soil. It consists of a steel ring approximately ½ metre in diameter with metal hooks attached around the circumference. The hooks are hammered home and the ring becomes the anchor point. The Auger (see Figure 4) is a steel rod about a metre long with a large double edge blade which enables it to be screwed into the soil. A tommy bar is slotted through the ring at the top of the rod to provide leverage.

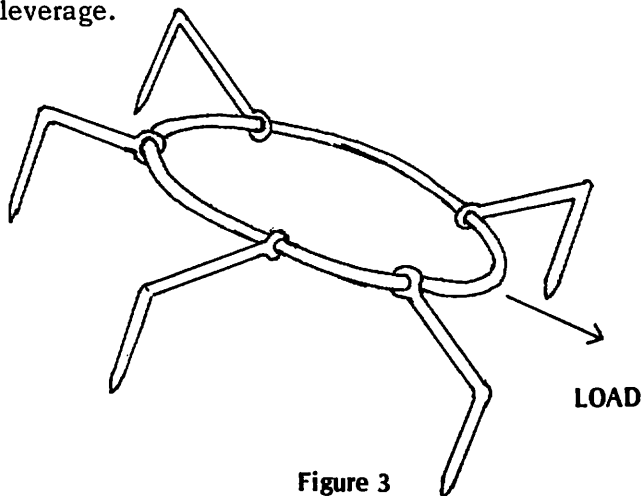


Figure 3

The above anchors are not suitable in areas of thin soil or loose sand which pose special problems. A technique of providing a secure belay in

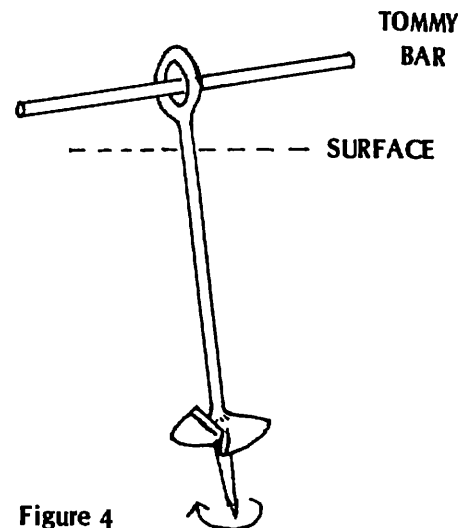


Figure 4

thin soil is to use six small steel stakes spaced alternate sides of the rope at intervals of 0.6 meters (see Figure 5). The stakes are attached to the main anchor rope by prussick loops of 7 mm. nylon line. Each individual sling can be adjusted so the load is equally shared between the six points. It may be possible to provide a secure anchor point in loose sand by utilizing the deadman snow belay plate (see Figure 6) which could be buried at an angle of 45 degrees to the surface and used with a two man wire sling loaded parallel to the surface. This method may have applications in Desert Rescue enabling a suitably equipped vehicle to winch itself out of soft sand.

*(Continued on page 10)*



# NEWS & rumors

## IN ANTICIPATION OF A DROUGHT STRICKEN SUMMER AND ITS SAR MISSIONS

In order to keep body core temperatures within normal body ranges for maximum body performance during summer rescue missions we need to bring as much emphasis to heat stress physiology as Search & Rescue has to the condition of hypothermia. For SAR missions at high temperatures it is necessary to lose body heat through sweating, while maintaining the lowest possible loss of body fluid through sweating. At first this *appears* to be an impossibility as one concept opposes the other. But, not so says Dr. E. R. Nader and Dr. J. A. Stolwijk of Pierce Labs at Yale University in their studies for NASA.

There is an individually variable sweating rate at which the rate of sweating maintains the body core temperature at a constant. This is called "steady-state" sweating rate. The goal is to attain in this steady-state sweating rate a reduced central sweating drive (lower core temperature) so as to spare the cardiovascular system from a high level of peripheral circulatory demand.

The heat and aerobic exercise acclimated individual attains this steady-state sweating rate at a somewhat lower level of core temperature than that of the merely well and fit aerobic conditional person. In addition, studies also indicate that wetness of skin further reduces the whole body sweating rate even at a high core temperature.

To apply these findings to physical conditioning for the summer rescue season ahead, we should be exercising in a warm, humid environment ( $36^{\circ}\text{C}$  - water vapor pressure = 35 Torr). In addition these studies show that a film of sweat on the skin while exercising or working in heat (for the fit individual) permits the attainment of the steady-state sweating rate at an even lower body core temperature and with an even smaller body fluid loss-reduction. Viewed from this information, the Arabs use of loose wool clothing in the desert heat makes even greater sense.

The work in understanding heat stress is only in the beginning stages so far as Search & Rescue application goes. It is necessary to make as great strides in understanding the effects of heat upon SAR personnel as has been achieved for hypothermia.

Send all information on heat stress and heat related findings to Stan G. Bush, NASAR Chairman for Emergency Medical Services, 2415 East Maplewood Ave., Littleton, CO 80121.

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## GENERAL MOORE NEW MAC COMMANDER IN CHIEF

HQ MILITARY AIRLIFT COMMAND, Scott Air Force Base, Ill. — Secretary of Defense Harold Brown today (March 7) announced that the President has nominated Lt. Gen. William G. Moore, Jr., for promotion to general and assignment as Commander in Chief, Military Airlift Command, and Executive Director for Airlift Service, Scott Air Force Base, Ill.

General Moore is currently assigned as the Air Force Assistant Vice Chief of Staff with additional duty as the Senior Air Force Member, Military Staff Committee, United Nations.

General Moore will succeed General Paul K. Carlton who is retiring on March 31 in his current grade. General Carlton was named commander of MAC in September 1972 and became MAC Commander in Chief Feb. 1 when the command was designated a Specified Command.

(Continued on page 15)



Dear Sir:

Recently read an article relative to taxing mountain climbers for their costly accidents and the search and rescue operations attending same.

As a backpacker, trail camper and outdoorsman for many years, I was incensed to read of this ridiculous statement by a newspaperman. An editorial even - a compounded asinine statement of half-truths.

While mountain climbers are indeed involved in accidents which become costly search and rescue operations, the numbers compare to all others is infinitely small. Hikers, backpackers, spelunkers, lost children, lost hunters, lost fishermen, downed aircraft, ad infinitum—make up the long list of people involved in search and rescue operations.

As one deeply involved in the trails movement. I am concerned about such begoted, one-sided reactions against one of the truly rugged outdoor sports.

In the 94th Congress a bill was presented to increase the money for S & R, work in our *national forests*, not parks. The bill died in committee. The point being is that *some few* legislators are concerned.

The cost of S & R operations are high - but lives are priceless.

If, indeed, a tax need be placed, it should be on all the millions who use our national parks, national forests, BLM lands, etc., not just on the few thousands who climb our mountains!

On behalf of our thousands of members, we believe the private S & R teams, state teams, sheriff's departments, et al, are doing a herculean job! Also, based on all available information, these organizations are better qualified than most part and forest personnel.

Concerned,

LANCE FEILD, President  
International Backpackers Assn.

Dear Sir:

Author currently engaged in research into the field of communication support for Emergency Medical and Rescue Service. Would like to receive correspondence from any individual currently active in such operations or with detailed knowledge of same. Especially interested in how different organizations have established their electronic communications requirements in support of EMRS, specific equipment utilized in such operations, problems and solutions in electronic communications during such emergency medical/rescue operations, etc.

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- o A history of biomedical monitoring of test parachutists
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- o An economical approach to an aircraft accident data retrieval system (AIRS)

For further information contact: SAFE Association, P.O. Box 631, Canoga Park, CA. 91303 (213) 340-3961



A graduate in physics and mathematics, Ms. Bryson first taught in the Peace Corps, then performed systems analysis and instruction for the Air Force Remote Satellite Tracking System. A summer wilderness ranger with the Forest Service, Sandy worked this winter with Heavenly Ski Patrol at Lake Tahoe and is now a full time writer and photographer.

# take that tablet “with a grain of salt”

by Sandy Bryson

*(The subject of salt tablets vs. heat disorders is, to say the least, highly controversial. The opinions expressed herein represent but one school of thought and should carefully be considered and researched. Ed.)*

Should people under high stress, such as climbers, runners, and persons on search and rescue operations, take salt tablets to forestall body trauma? This subject is controversial, particularly among the medically untrained and those who have *coincidentally* felt better after taking salt.

It is important to point out that when one takes salt tablets, it is not actually *salt* that he is trying to replace. It is *sodium*, which, along with chloride, forms the compound named salt. It is primarily sodium rather than the salt compound that some believe is lost in excess from the body during stress.

Typically, a search scene entails a day or two or three of high stress activity out in the boonies doing whatever people do on searches. Salt intake is not recommended in this sort of situation. Not only is increased salt intake of questionable value; there are specific reasons why the practice should be avoided. Consider, for example, someone who has high blood pressure. Taking salt tablets could seriously harm that person. Many people are not aware of their high blood pressure. This is especially true of the pencil-pushing, desk-sitting types who randomly walk out into search scenes and ingest salt tablets.

There are basically three disorders that tend to occur in high-heat situations. These are: heat exhaustion or heat prostration; heat stroke or sunstroke; and heat cramps. Actually none of these involves a salt depletion problem.

## heat exhaustion

Let us consider each of these disorders separately, starting with heat exhaustion. Heat exhaustion is essentially an extreme reduction in the volume of the blood. Instead of a salt *deficiency* in this condition, there may in fact be a salt *excess*. Searchers' experiences verify that the person involved has the appearance of being in shock, and this of course is a

sign of low blood volume. The symptoms are weakness, dizziness, stupor, headache, cool pale skin, probably profuse perspiration, and low blood pressure.

## heat stroke

The next disorder, heat stroke, is a problem SAR people have experienced from the Idaho plateaux to the Baja deserts. This condition is literally a medical emergency. It is *absolutely not a salt problem*, but rather is a problem with a structure in the brain called the hypothalamus. It is characterized by a failure of the body's heat regulating mechanism located in the hypothalamus with resulting *loss of consciousness*. One of the distinguishing features of heat stroke is that *sweating ceases as the body temperature increases*.

## heat cramps

The other disorder, heat cramps, usually occurs in a situation such as this: A person who has not exercised for a long time, say eight months or so, exerts himself physically for a day or two and suffers excruciating leg cramps. Disturbances in the body such as those involving salt may play a part, but salt by mouth is not the cure. In most cases, if the person rests and is reassured, he will presently be magically healed. If while he is resting you stuff a salt tablet into him, he will still heal, and you may erroneously assume the salt tablet contributed to the healing.

## salt depletion

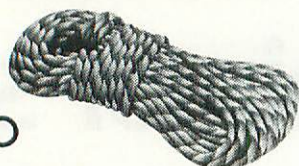
When a person's body temperature rises past a certain point, as during fever or vigorous exercise, he begins to perspire. As the sweat evaporates from his skin, it has the effect of reducing the body temperature. Salt is lost in sweat. What is important to realize, however, is that approximately 50 percent of the water loss from the body occurs through the lungs during expiration — and there is no loss of salt through expiration. This water lost through expiration is essentially distilled. This thus weakens the argument that water loss from the body necessitates an increased intake of salt.

*(Continued on page 12)*



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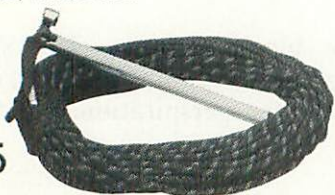


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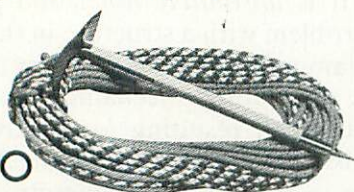


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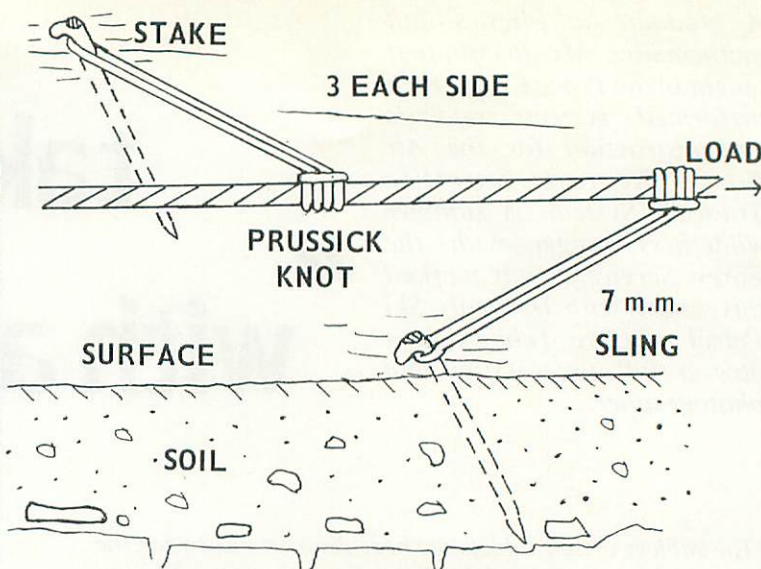


Figure 5

The other major problem of sea cliff rescue is the friable nature of the cliff edge and subsequent danger of rock slides. The methods used to counter this included edge pulleys, canvas matting, rope ladders (a Scotsman) and lightweight tripods equipped with pulley blocks. The edge pulley consists of a series of rollers on a flexible section so as to follow the contour of the cliff edge.

The rope runs on the pulleys thereby avoiding contact with the cliff top. Unfortunately it is possible for the rope to jump out of the edge pulley and foul on the cliff edge. A metre wide sheet of canvas rolled down the cliff face may be one possible answer, with the cover preventing the rope from cutting into the cliff edge. The Coast Guard traditionally use a type of rope ladder with wooden rungs close together to provide a running surface for the rescue ropes. A very recent innovation has been the development of a lightweight tripod from which the rope is suspended running through a side loading pulley. This keeps the rope up above the cliff edge and also facilitates the lifting of the casualty onto the cliff top which is always difficult with low belay points.

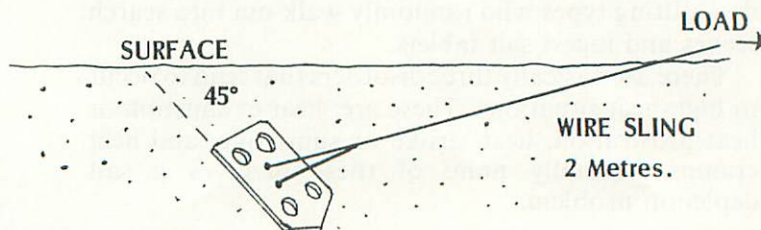


Figure 6

As with all rescue situations different techniques are developed to deal with local circumstances and the author would be interested in the personal experiences of rescue teams and how they solve the problem of adequate secure anchors in difficult situations.





## SEARCH AND RESCUE DOG TRAINING

By Sandy Bryson

### Review by Bill Dooley

Having read the book *Search and Rescue Dog Training*, by Sandy Bryson, I must say that the book is very well written and organized. There was no doubt a tremendous amount of research involved, and it is well represented in this very comprehensive and informative overview of the search dog and his trainer.

Speaking from a trainer's viewpoint, I would like to have seen more specific information on "how to train the dog" and a little less emphasis placed on schedules. Many of the techniques that can be employed in SAR dog training are covered quite well.

There is one area, however, in which I must disagree with Ms. Bryson. Starting a dog in a training program at the age of four months and expecting the kind of performance as specified seems a task that a professional would have difficulty with to say nothing of the troubles a novice would encounter.

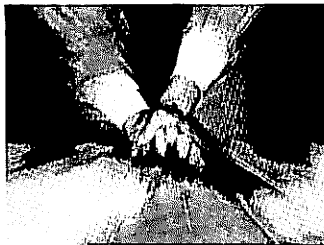
Essentially, the author has presented a valid, usable guide covering nearly every aspect of search dog selection, training and handling. *Search and Rescue Dog Training* is definitely a must for anyone interested in starting a rescue dog team or for the experienced dog handler seeking a better understanding of the search dog and the search function.

Bill Dooley has trained dogs professionally since 1949 encompassing training in almost every area including AKC obedience, Schutzhund, various dogs for police departments which include both tracking and air scenting, narcotics detection, and even dogs to search out black-footed Ferrets for the U. S. Wildlife Department.

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## SALT TABLETS, *continued*

When a large amount of salt is lost through perspiration, a hormone is released in the body that causes the kidney to reduce the amount of salt being excreted in the urine. This dramatically conserves the body's salt supply. This system is so efficient that searchers can, for a few days they may be on a mission, eat a normal diet with its regular supply of salt without suffering salt depletion.

People doing vigorous mountain work have given up salt tablets and have resorted to the maxim that "if you aren't *peeing* every couple hours or so, you aren't drinking enough liquids." An incredible number of field hours bear this out. This simple gauge makes more sense and addresses the real problem in heat disorders; that is, a reduced fluid content of the blood and the need to drink more water.

Potassium is a constituent of commercially sold heat tablets, so that when a person takes salt tablets, he is also increasing his intake of potassium. This is unnecessary. Though potassium loss goes on continuously, only an insignificant amount is lost in sweat and none is lost through the lungs. Moreover, since potassium is abundant in most fruits, it can quickly be replaced. For example, a hospital patient taking a drug called hydrochlorothiazide that forces potassium excretion can replace all his loss just by eating a couple of bananas each day.

For some obscure reason, possibly as a binder, calcium is included as an ingredient in salt tablets. No

adequately nourished adult in the U.S. today needs to supplement his diet with calcium. Despite the claims of milk advertisers, we don't need to drink milk to obtain calcium. When the level of calcium in our blood drops too low, a hormone is released that causes calcium to be released from our bones, thus raising our blood level of calcium. There is no physiological reason for calcium to be present in heat tablets or any other pills one wants to take.

One of the possible reasons ingesting salt tablets became popular is that it was observed that salt in the mouth increased thirst and motivated one to drink more water. If you measure the salt in the blood of a salt depleted person, such as a SAR person, you will find excess salt. It is such an excess that stimulates thirst. This contradicts the basic thesis for taking salt tablets — which assumes salt depletion.

If one wishes to take salt tablets just for the sake of tradition, he should do so with discretion. Taking salt tablets for this reason is an interesting parallel to the Milk of Magnesia trend many doctors see. It is a habit people get into perhaps because it makes them feel sort of nifty.

To sum up, a person who isn't well fed is in danger of many things, including salt depletion. So SAR personnel should be well fed. The fact is that for persons undergoing acute exertion, salt pills are possibly harmful, and at best superfluous. What is important is to have some regimen for drinking fluids.



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# 'TORNADO!' funnel of fury

grover brinkman

"Tornado!"

Let's hope you never hear this cry of warning.

First it was a dark, ominous cloud lying low on the horizon, laced with yellow, wind-driven, tumbling in the sky. Then from the dark mass a slender funnel shot earthward quicker than the eye can blink, and a tornado was born.

It roared forward over the flat prairie, traveling from the southwest into the northeast, a narrow path of destruction, perhaps less than a half mile in width. But inside that funnel nothing remained intact.

The fury of a tornado is chilling to anyone who has watched one approach. It terrorizes, freezes the mind! One stands entranced, watching it roar closer, weaving back and forth like a serpent, catching up everything in its path, tearing, ripping, denuding the earth.

But this is the wrong thing to do! Don't stand paralyzed. Ascertain the direction of the storm's approach, then try to escape by running at right angles from that shrieking funnel. If this is impossible, seek shelter where there is less chance of falling debris — in a roadside ditch if nothing else.

What causes this freak storm labeled a tornado?

First, let's describe what it is, in brief a violent whirling wind, always accompanied by a funnel-like spout that touches the earth, often hedge-hopping. It is caused by the meeting of different air masses, under varied atmospheric conditions. A great section of the U.S. flatlands is alluded to as "Tornado Alley," for in these

plains states, which include Oklahoma, Texas, Kansas, Illinois, Iowa and others, air conditions spout tornadoes more frequently than elsewhere in the nation.

Tornadoes twist, crush, maim. Anything caught in the vortex of that funnel is beaten to death. Buildings literally explode as a twister strikes, and debris is often carried for great distances. Fragile straws are driven, like nails, into the trunks of trees; chickens are often denuded of their feathers. Such is the force of this whirling wind.

Tornadoes will always be dangerous. But today, science has done much to safe-guard against them. Thousands of radio and TV stations and radar scanners warn of their approach. CBers spread the news of a tornado's path as well.

Best way to foretell a tornado's approach? Learn to read the skies, an old weather man persists. Weather moves with the winds, from west to east. Good weather may be expected with winds blowing from southwest and west to northwest, and unsettled weather when the winds shift to the east. Extremely hot, muggy days often give birth to a tornado.

(Continued on next page)



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Air moves in large masses. When cold Polar air comes down from the north it chills the continent and clears the skies. But when this chilled air collides with and is displaced with large masses of warmer air, storms can be expected, including tornadoes.

How destructive is a tornado? Remember, wind velocities of over 100 miles per hour have been charted in a tornado. The extremely low air pressure in the "eye" of the tornado causes buildings to explode, with walls and windows falling outward instead of inward. Because of rotating winds sucking air from the center of the tornado, a partial vacuum results, causing the explosions of buildings. Generally a lot of lightning accompanies these funnel clouds, adding to their danger. The combined forces of air pressure, high velocity winds and electrical discharges, make the tornado one of the worst storms known to man. This is not an attempt to frighten, but is merely asserting a fact.

Even today's advanced scientists differ in tornado theories. Some insist they are caused by hot air rising and cool air sinking. Others claim that converging rotary winds already in existence meet and form the funnel.

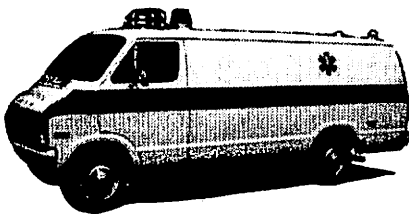
For some reason, more tornadoes are spawned in the spring and summer of the year than at any other season. So listen to the weather man on the radio or TV, watch the sky.

Study clouds, learn to recognize cirro cumulus, alto cumulus, and other formations. Remember that the wind is tricky, and often changes direction in minutes, spawning a new weather front.

Watch the heavens on those days when radio announces a tornado watch. Then if you see a funnel approaching, act immediately; choke down your terror and keep cool so you may think; it may save your life!

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# CALENDAR

**JUNE 20-24, 1977**

**SAR Management Course, "Managing The Search Function"**  
Saratoga, California, West Valley Community College

Contact: Tom Smith, Coordinator, Park Management School  
West Valley Community College,

Saratoga, CA. (408) 379-1733

or Jim Brady, Chairman, NASAR Training Committee  
Instructor, National Park Service, Box 477  
Albright Training Center, Grand Canyon, Arizona

**JULY 24-29, 1977**

**Civil Air Patrol Annual SAR Course**

National SAR School, New York

Contact: Robert Mattson, National SAR School,

U.S. Coast Guard Training Center

Governors Island, New York 10004 (212) 264-3313

**JULY 31 - AUGUST 6, 1977**

**Coast Guard Auxiliary Annual SAR Course**

National SAR School, New York

Contact: Gary Crosby, National SAR School

U.S. Coast Guard Training Center

Governors Island, New York 10004 (212) 264-3313

**AUGUST 6-7, 1977**

**Tracking Dog Clinic** - Glen Johnson, Instructor  
Golden, Colorado, Camp George West

Contact: Helen Phillip (303) 423-5225

or Jo Ann Weller (303) 659-6832

**SEPTEMBER 15-18, 1977**

**9th NASAR Conference, Nashville, Tennessee**

Contact: Lois McCoy, P.O. Box 2123

La Jolla, Ca 92038

(714) 276-7228

**SEPTEMBER 22-25, 1977**

**Mountain Rescue Association Workshop and Conference**

Los Angeles, California, Angeles National Forest

Contact: Abbey Keith, Mountain Rescue Assn.,

P.O. Box 396, Altadena, Ca 91001 (213) 339-1271

**OCTOBER 2-6, 1977**

**26th Annual National Conference** - joint meeting of the  
California Emergency Services Association and United States  
Civil Defense Council, Long Beach, Calif., aboard Queen Mary

Contact: Evar Peterson - (213) 595-1751

**OCTOBER 8 & 9, 1977**

**5th Annual Desert Rescue Squad Seminar**

Barstow, California, Ft. Irwin

Contact: P. J. Desjardins, Secretary,

P. O. Box 108, Barstow, CA 92311

**OCTOBER 31 - NOVEMBER 4, 1977**

**National Avalanche School, Reno, Nevada**

Contact: Maj. Pete Zadra, 555 Wright Way,

Carson City, Nevada 89711 (702) 885-5300

**OCTOBER 6, 7 & 8, 1978**

**NASAR 1978 Convention, Albuquerque, New Mexico**

Contact: Rick Goodman, NASAR 2nd Vice President

**SEARCH AND RESCUE MAGAZINE**  
invites listings of upcoming events pertaining  
to the rescue and emergency care fields. Please  
send entries to Calendar, Search and Rescue  
Magazine, P.O. Box 153, Montrose, CA  
91020.



## DOD TRANSPORTS SAR VOLUNTEERS

Officials in the Department of Defense (DOD) have reviewed this matter of transportation carefully and concluded that the current policy should be revised so that DOD transportation resources (air or surface) may be utilized within approved operating and training programs on a non-interference nonreimbursable basis, for movement of nonprofit volunteer civilian search and rescue personnel and their equipment (including animals) to and from a search scene when their assistance has been requested by competent federal, state or local government authorities who are responsible for coordinating and conducting the search and rescue efforts.

## NATIONAL TRANSPORTATION SAFETY BOARD

Frank T. Taylor, a 35-year veteran of aviation, has been named to head the National Transportation Safety Board's Bureau of Accident Investigation.

As Director of the Bureau, Mr. Taylor is responsible for all accident investigations conducted by the Board in rail, pipeline, highway, marine, and civil aviation transportation. Prior to his appointment, Mr. Taylor had directed the Bureau on an acting basis and earlier served as Chief of the Board's Investigation Division.

The Board also announced the appointment of Gerard M. Bruggink as Deputy Director of the Bureau of Accident Investigation. Prior to his appointment, Mr. Bruggink was Chief of the Board's Field Investigation Division.

Before joining the Board in 1969, Mr. Bruggink, who holds a commercial pilot's certificate, was Chief of the Flight Safety Foundation's Human Factors Branch.

# MAN TRACKING

From the publishers of Search and Rescue Magazine comes the first and only serious attempt at documenting the basics of this important search technique.

By  
Roland Robbins

## INTRODUCTION TO THE STEP-BY-STEP METHOD

If you are in any way involved in Search and Rescue then you should be aware of the latest techniques in Mantracking.

In collaboration with the U.S. Border Patrol at El Cajon, California (most notably our good friends and patient instructors Ab Taylor and Jack Kearney), the China Lake Mountain Rescue Group has compiled and edited a book on this most useful and challenging skill.

A limited first-run edition is now being printed and will be available in July of this year. Mantracking is a 120 page, soft-bound manual complete with numerous descriptive diagrams and pictures.

What is the success record for these men who so diligently practiced and taught the art of tracking? As of mid-1975, the record stands that on all missions involving children, on which the Border Patrol has been requested, the subjects have been found alive and well.

"This sort of record gets attention. Realistically it is more than we can hope to continue. However, it is a dramatic indication that, properly employed, tracking can be a rapid method of search."

Ab Taylor, U.S. Border Patrol

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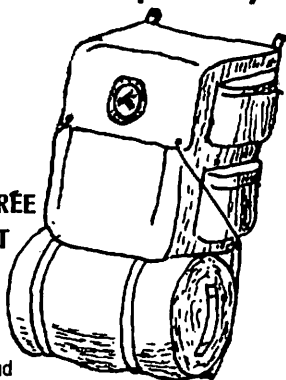
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## NASAR EXECUTIVE MESSAGE

by Rick Goodman  
2nd V.P.

"Continental Flight #91, now boarding, gate 3, destination, San Francisco." "It's about time," I said to myself, as I got into line to board the big jet for a trip to San Francisco. Two hours flight time will give me plenty of time to read some articles on SAR, and to compose my executive message. Grabbing a seat in the rear of the plane by a window was fairly easy. A smooth take-off and into the beautiful blue sky of New Mexico.

As I settled back, I got my briefcase with the NASAR emblem on the side and pulled out the first bit of reading material that I wanted to go through—**SATELLITES FOR DISTRESS ALERTING AND LOCATING. SUPER!** I've been waiting on this information for some time.

As I looked across the aisle, there was a gentleman staring at the NASAR emblem. He mentioned to me that he had heard about search and rescue, but knew very little about it. He explained he was from Liverpool, England and was teaching soccer at the University of New Mexico and the University of California at Berkely. That's when we hit our first bump. As I looked out the window, I could see a few cumulous clouds drifting by and remembered that on the news the night before they had mentioned a storm front somewhere in Arizona.

The bumps were occurring more frequently, and the stewardess advised us that there would be no lunch served on the flight because of the turbulence.

I turned back to my new-found friend and mentioned to him that in this report I was reading, there were some very enlightening facts concerning downed aircraft. That 40% of the people who survive air crashes do not live the first 8 hours, and 80% do not live the first 24 hours. Considering the fact that the average resuce time as mentioned in the report was 48

hours, then 90% of the people who survive the air crashes expire before help can get to them.

The bumps are coming faster! The pilot comes on the PA and advises that we are slowing down and going to drop down in altitude and try to get through the storm front. It was obvious to me by now that there would be no reading on this flight.

As we flew on towards San Francisco, I found myself thinking, "what would happen if we did go down? Who would come looking for us? The search and rescue teams of Arizona, Nevada, and California? Do they have the same problems that we have in New Mexico? Would an ELT be picked up? Would there possibly be little or no action for 6 or 8 hours?"

As I remembered the experiences I've shared with many of you at NASAR conventions and board meetings, the thought came to me that basically our conversations were at level of management, of how we can better train people or PSAR, the preventive action. Never do I recall discussing immediate response time. How long does it take an average team once they are called to get to the field? Another bump! I wonder if NASAR has ever looked into response time from the initial call to the time the teams get to the field. This could bear looking into; and I told myself that as soon as I got back, I would. Let's find out just what chance people have the first 8 hours after the call comes in that they're in trouble. Is the bureaucracy such that calls cannot get to the teams immediately? How many people are we losing because of poor notification procedures? Have we, in the search and rescue business, got to the point that we cannot see the forest because of the trees? Are we so involved in training, regional and national service centers and Ad Hoc committees that we forget that the first 8 hours are most important?

Boy, that was a big bump! "I think we're through it", I told my seat partner. "That had to be it," thinking to myself, "it can't get much worse." About this time the plane started settling down. It looked like we were finally through the front and could relax the rest of the trip. 30 minutes to go. Boy, am I glad this trip is almost over!

When I got on the flight, I had a project — to write the executive message for this quarter, so on to it!

As I dug through my briefcase and pulled out my pad and pencil, the English chap turned to me and said, "Thank God, there are people like you who risk their lives to save others. I'll never forget the conversation we had on this flight. All the times I've flown around the world, I have never had a trip as rough as this one. I never thought what would happen if the aircraft I was in, went down. Keep up the good work; and if you're ever near a soccer field, think of me."

I thanked the gentleman and turned to my writing. My mind drew a blank. I'd wait until I got to Oakland and write the message once I got to my hotel room. Let's see, after I land in San Francisco, I catch the helicopter to Oakland. What would happen if the helicopter . . .

# Search and Rescue is going to the "DOGS?"

**bob & marcia koenig**

The wind was coming from the south, so I shifted the dog to an east-west pattern parallel to the highway. The sound of a semi on the blacktop pierced the brittle, sub-freezing night air. Dolf and I were completing the second pass when we came upon a creek about ten feet wide. The dog alerted with a whine, nose high in the air, and jumped the creek.

I knew that was it! Keeping a sharp eye on Dolf's direction, I hastily found a five-foot-wide crossing to jump and caught up with him shortly to find him sniffing at a hump on the ground with his tail wagging furiously. I didn't recognize the form until I was within five feet and was amazed to find a tiny man coiled in the fetal position. As I knelt down, the man peeked up and asked, "Do I have to go back now?"

The 72-year-old man was a senile, cardiac patient who had been missing from the nearby nursing home for the past 19 hours. He was chilled, so as I bundled him up in spare clothing, I notified base on the radio. Soon the other dog teams converged on us, and together we evacuated him back to the home where a doctor was waiting to check him over.

Overly simple and dramatic, maybe, but this is one of the over 400 recorded missions of the American Rescue Dog Association units. Because of the effectiveness of air-scenting search dogs, there has been a growing interest in the use of this type of dog in search and rescue work.

In 1972, search and rescue dog groups (all German Shepherd) from five states banded together to form the American Rescue Dog Association. Their goals were to:

1. Provide uniform standards of training and expertise in both dogs and handlers to that official agencies could be assured of receiving an experienced and professional quality of service.

2. Provide an organized unit, structured to operate efficiently and in a coordinated fashion such that a search director could alert, use, and dispatch them with ease.

3. Provide a free and voluntary service, on 24-hour alert, to any authorized agency upon request.

4. Promote continued education of ARDA units in the skills of dog training, wilderness navigation, radio communications, management of environmental injuries and rescue, victim behavior, and all manner of search strategies.



**ARDA Board Meeting**

tegy skills.

5. Strive to contribute to the improvement of the German Shepherd search and rescue dog as well as search and rescue in general.

People who are interested in SAR Dog Units often have similar questions. The following are some of the most frequently asked questions:

1. Why do you use air scenting dogs?

Air scenting dogs are more versatile. Ground track smells are adversely affected by weather conditions, last for relatively short periods of time, and are easily destroyed by numbers of people in the area. In avalanches and disaster areas there are no tracks.

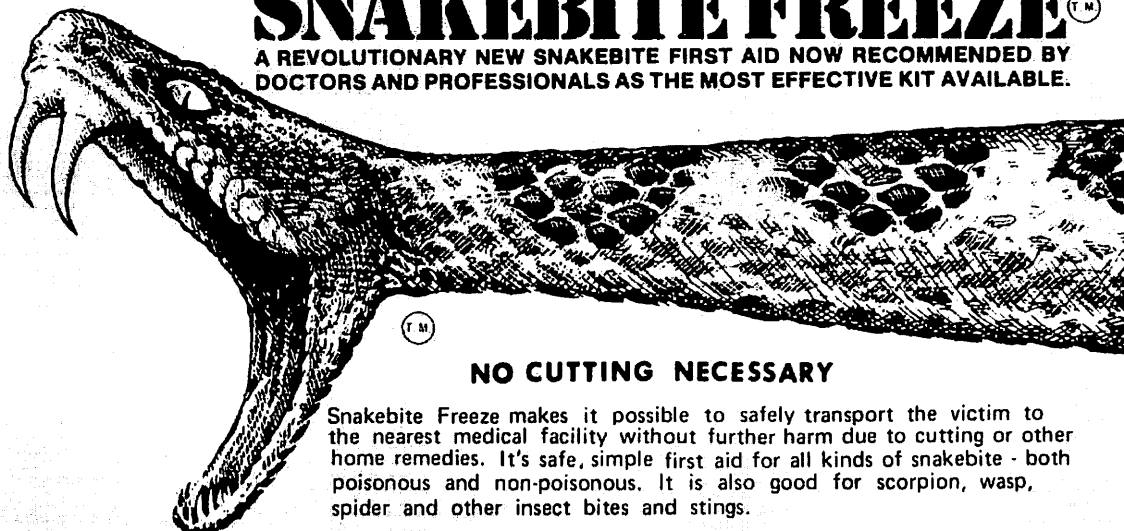
As the air scenting dog does not depend on ground trails, knowledge of a victim's starting point is not required. The lack of a trail (or the wrong trail) is not a hindrance. If large numbers of other searchers have passed through the area, a SAR dog can still go in and search for the airborne scent a short while later. Time and weather conditions have very little effect on airborne scent.

ARDA dogs can and will work a ground scent that is fresh and strong, but since either the correct direction or starting point is usually unknown, or at best uncertain, air scenting often proves to be faster. It is also quite possible for a moving person to stay ahead of a tracking dog, but searching dogs can be strategically placed so as to contain a victim in a potential area and search inward toward him.

*(Continued on next page)*



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2. How are the dogs used for searching?

A dog and handler as a team are assigned an area as indicated by the search strategy. Equipped with a radio and all relevant information, they proceed to the area and start searching. Since the motion of the wind will carry the victim's scent some distance, they will begin on the downwind side of the area (when possible) and work basically cross-wind patterns through the area allowing the air motion to sweep the scents toward the dog. The dog's advantage comes from the fact that the handler/dog team is searching for the scent of and not just the sight of the victim. For this reason, the dog is particularly useful at night. By skilled use of terrain analysis and air currents, the team need traverse only a small percentage of the area to obtain a high-probability coverage. The usual goal is 80-90% coverage.

3. Do you need a scent article?

No. Tracking dogs are given a scent article to help them locate and identify the trail of scent and ground disturbance that a person leaves behind as they travel through an area.

SAR dogs are trained to use airborne scent and to find any human in the area, much like a hunting dog scents birds. Particles and micro-droplets of scent are constantly emitted from a person's body (even after death) and carried along the air currents. The dogs are

trained to search under the verbal guidance of the handler until they locate this airborne scent and then follow it to the source (the victim). With this type of training they can find people buried beneath disaster rubble or snow, since the human scent will filter to the surface.

(Continued on page 20)

### Closing in on the victim



# PIKES PEAK

## The Longest Vertical Rescue in Colorado's History

by Mike Taigman  
(Rescue Team Leader)

It was Sunday morning, September 19, 1976. Ed Kornfield, a fifty year old Denver florist, was attempting a solo climb of Pike's Peak. Becoming disoriented in a snowstorm, Ed slipped and fell about thirty feet, fracturing his left leg.

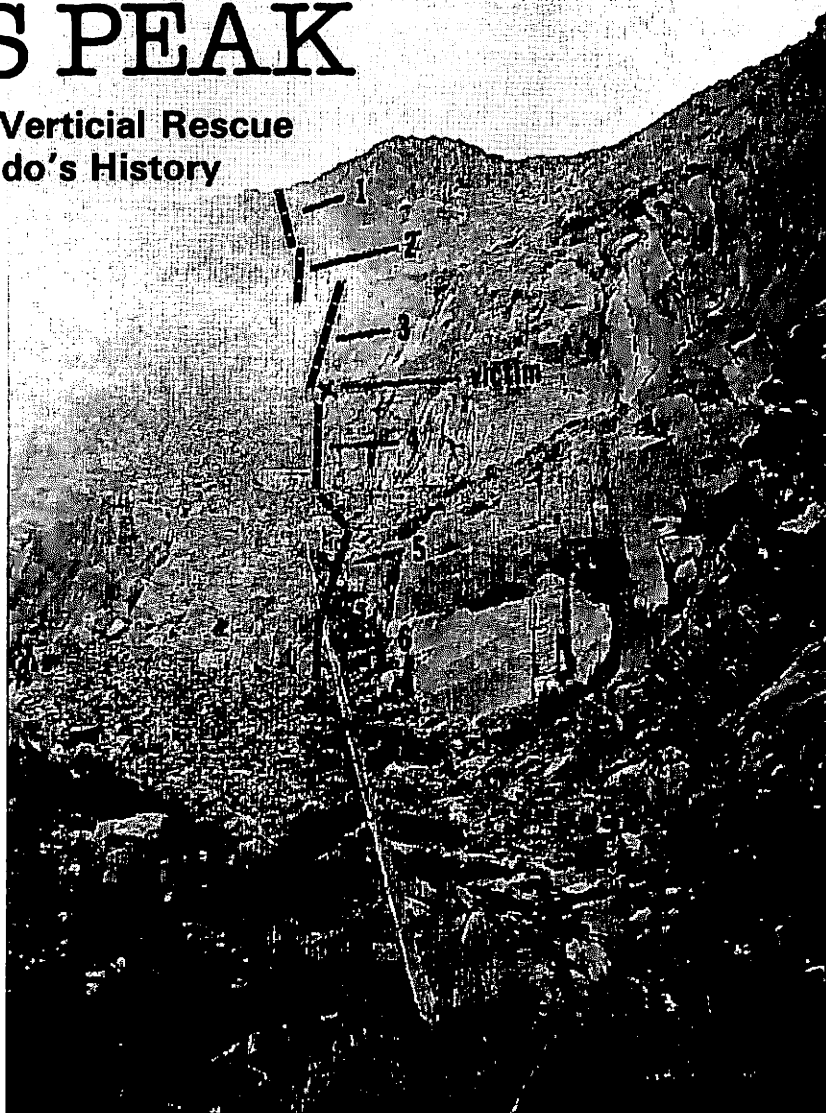
When Ed didn't arrive at home that night, Mrs. Kornfield contacted the El Paso County Sheriff's Department to report him missing. A search was promptly started by the El Paso County SAR Team, coordinated by Ron Holiday. Simultaneously, the Kornfield family was being questioned by Jim Wilson, a highly trained police interrogator and searcher.

El Paso searched throughout the night Sunday and all day Monday. During this time it snowed twice. Monday night Holiday contacted the Colorado Search and Rescue Board, asking that twenty members of the Arapahoe Rescue Patrol be sent to mission base early Tuesday, September 22.

As we arrived in base, the victim was sighted by an El Paso field team. Ed Kornfield was a small orange dot in the middle of a large cliff formation high above an area known as "The Bottomless Pit." A bash team of seven technical climbers from Arapahoe and one from El Paso were driven to a point high above the orange dot, at an elevation of 14,050 feet. At the same time a Huey from Fort Carson had succeeded in landing in "The Bottomless Pit," far below.

Back at the top, we started our descent with several rappels, including a 300 foot snowfield, a 150 foot waterfall, (Did you know that water tends to follow the rope until it displaces in your lap?) and a 300 foot rock face. We reached Ed at 10:45, some forty hours after he fell. It was a pleasant surprise to find Mr. Kornfield conscious, coherent and in amazingly good spirits. Our medical evaluation found his lower left leg to be discolored, swollen and angulated.

By 11:45 the El Paso team of four that had spotted Ed had climbed up to join us. One of the four was Dr. Langstaff, Director of the Emergency Room at St. Frances Hospital in Colorado springs. At the same time an Arapahoe Rescue support team of seven was arriving from above with stokes, IVs, more ropes and technical gear. We placed the leg in traction by strapping Ed's shoulders to the top of the stokes and tied a traction ankle wrap to the foot of the stokes. We



### Evacuation route taken from chopper LZ

1. 300' vertical snow field
2. 15' cliff including a waterfall
3. 300' cliff
1. Victim
4. 275' high angle evac
5. Steep scree
6. 150' high angle evac
7. Steep scree and vertical forrest

gave 950 cc of lactate and Ringers before starting the long evac down to the Huey.

The first part of the descent with the victim was a 275 foot high-angle cliff. To lower the stokes horizontally, we used a brake plate with a double rope system and had two men on the litter. Next came several 300 foot rope lengths of steep scree and talus. We had three brake plates so we could set up consecutive anchors. By the time the litter reached the end of our rope the next anchor was set up and we could just tie into it and continue — making our evac quick and smooth.

At the bottom of another 150 foot cliff, we were met by two more searchers from El Paso. They had set up a

(Continued on page 22)



## RESCUE DOGS, *continued*

If many people have recently passed through an area and moderate amounts of human scent still linger, a *reliable* scent article is useful, but still not necessary. Some dogs have had more training with scent articles and may get "turned on" by the use of one.

### 4. What is a good scent article?

Any article of apparel or bedding that has been in long close contact with the body of that particular person is a good scent article. It should be small enough to be easily carried by the handler and inexpensive in the event it becomes misplaced.

The articles may be handled lightly with the fingers in order to place them into a clean, odorfree bag or container. It is preferable that only one person — a family member — select and handle the clothing. This will minimize the likelihood of multiple maulings by several persons which then could destroy the scent qualities of the object.

Articles should be stored out of direct sunlight and/or severe weather, as well as away from odorous materials of any kind.

### 5. What kinds of dogs do you use?

ARDA uses the German Shepherd exclusively in search and rescue work. It's not simply a question of whether any breed can use its nose, but what breed can best fit the following requirements:

- A breed which has ready acceptance with official agencies.
- A size large enough to cope with all forms of terrain, and yet not too large to carry or hold in your lap (as in a helicopter).
- A double coat which will serve as insulation in ex-

treme heat and extreme cold.

d. A coat long enough to protect from scratches, nettles, and stickers, but not so long as to get snarled or matted with debris, and not easily distracted by wildlife.

f. A demonstrated ability for scent work.

g. A breed that is easily trained.

Most important, the German Shepherd is a breed that can be used in a wide variety of situations, from avalanche to desert. Highly-trained dogs and handlers are very scarce and must be able to respond to many different climates and terrains.

*(Continued on page 22)*

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*He was trapped chest-deep in the muck, forced deeper by every move....*

# Race against the tide

by Mary Jane Beck

In the frigid pre-dawn darkness of Nov. 8, 1975, Specialist Ned H. (Chip) Euliss Jr., 24, and Betty, his bride of three months, parked their jeep beside a California highway. A short distance away, Sonoma Creek flowed into San Pablo Bay, a northern extension of San Francisco Bay. The lights of San Francisco and its neighboring cities gave a ghostly illumination to the horizon.

Chip, a native of Hickory, N.C., and a laboratory assistant in tropical medicine at Letterman Army Institute of Research in San Francisco, hoped for a morning of good duck hunting. He took his rubber waders and his 12 gauge automatic shotgun and Betty her binoculars and a blanket from the jeep. Chip locked the jeep and tucked the keys in his pocket.

They walked about half a mile along a levee beside the Sonoma Creek slough. Finding a place to spread out their blanket, they settled down to wait until sunrise brought ducks flying over the waterway. They passed the time watching the many owls flying about.

Another three-quarters of an hour went by before the sun rose behind a scattering of clouds. Chip waited unsuccessfully for ducks to fly within range of his shotgun. Finally he put on his chest-high waders and headed for the water, leaving Betty to her bird-watching.

With many stops to watch for ducks, Chip slowly made his way through the high marsh grass toward a mud flat several hundred feet wide. Beyond lay the dredged-out creek channel. The tide was out, but when it came in the channel would fill and then flood the mud flat with treacherous speed.

Suddenly Chip realized he had gone too far into the mud. He stepped into a soft place and sank nearly to

his knees. He tried to wade to more solid ground, but his efforts to pull out one foot only drove the other in deeper. In desperation he tried to pull his legs out of his waders. He found himself immobilized by the thick, black, stinking mud. He could move in one direction only — down.

For a moment panic overcame him. Then, realizing his efforts to free himself made the situation worse, he forced himself to stop struggling. He discovered when he remained motionless he sank much more slowly. He looked at his watch; it was seven-thirty.

He had to get help fast. Betty was half a mile away and other hunters were in the area. Chip began to shout for help. No one heard him. He waved his gun and then fired several shots into the air. The only result was that the shotgun's kick drove him deeper into the mud.

At last he saw Betty running toward him, binoculars in hand. When she got within earshot he shouted, "Help! I can't get out!"

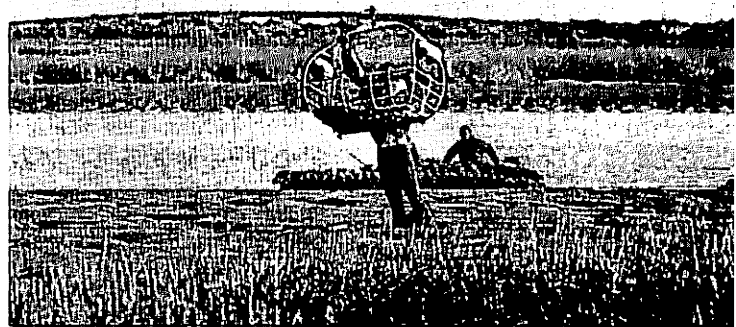
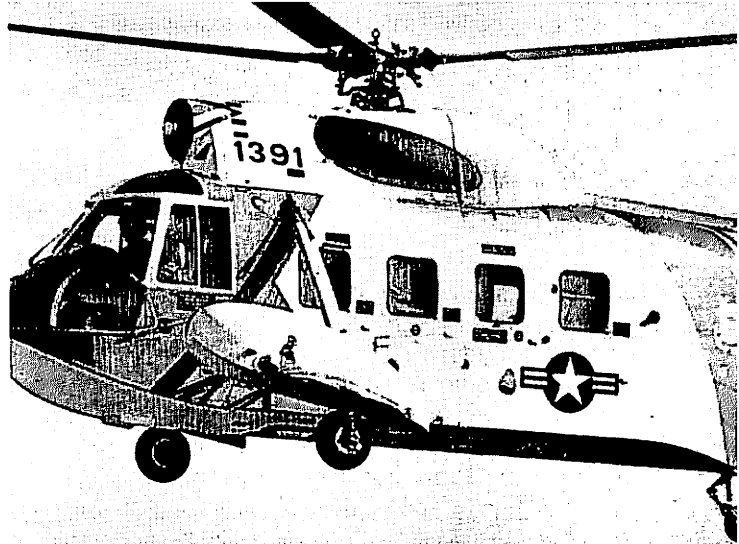
Even from that distance he could see the horror on Betty's face. In her effort to reach him she plunged into the mud to her ankles.

"I can't move!" he shouted. "You've got to go for help."

"But I can't leave you!" Her voice was an anguished wail.

"You've got to!" He struggled to hide his fear from her.

*(Continued on next page)*





## RESCUE DOGS, *continued*

### 6. *How do you choose a dog?*

Dogs for search and rescue work are chosen with a great deal of care, as a handler expects to work with his animal for nearly ten years. Usually the future search and rescue dog is selected as a puppy. Good temperament is the most important attribute and the dog must be trainable, stable, outgoing, and affectionate toward people. The dog must also have good structure and come from parents with normal joints to insure that he will be able to endure long hours of strenuous search work. The dog lives as a member of the handler's household, and their personalities must be suited to each other.

### 7. *How do you train a dog?*

Training is best started with a puppy, although an older dog can be used. The dog must, however, be young enough to have a useful service life. Training takes approximately one year and is based on hide and seek games.


Training a puppy begins as follows: It takes a handler, a helper, and a large open field with enough vegetation to hide an individual lying down. The helper holds the dog while the handler runs upwind in a large arc. While running away, the handler encourages the dog to find him. The handler then hides and the dog is released. When the dog gets the handler's scent, he will lift his nose into the wind. This behavior is reinforced and encouraged. Upon finding the handler, the dog is rewarded.

After the dog has mastered finding his own handler, he is ready to find other people. The method of training is similar and progresses to more complex problems including varying types of terrain. All the training is designed to encourage the dog to air scent with his nose in the wind.

Over a period of about one year, the dog will have graduated to more and more difficult terrain, vegetation, and longer working periods. This training process encompasses approximately 600-1000 hours in the field.

At the end of this training period, the handler will have the basic search dog, able to locate persons with a high degree of reliability under various conditions. Additional training progresses to avalanche and disaster work.

The American Rescue Dog Association has literature outlining how to start a German Shepherd Search and Rescue Unit and what ARDA can provide member units. If you're interested, write: ARDA, 10714 Royal Springs, Dallas, Texas 75229. — (214) 350-2648.

24-hour national alerting phone: (206) 937-3460. 

## PIKES PEAK, *continued*

radio patch to Denver, giving Ed a chance to talk with his wife and two sons.

Following our final descent, the Huey took off, carrying Ed and Dr. Langstaff to St. Frances Hospital. The remaining twenty-two rescuers were picked up by a Chinook and flown to base. Both choppers were supplied by Ft. Carson Army Base in Colorado Springs.

The total rescue, from drop off at the top to landing zone, covered 2,700 vertical feet— twice as high as the Empire State Building. ●

## RACE AGAINST THE TIDE. *continued*

"Are you sinking?"

"Only when I move."

"Hang on, *please!*" Betty turned and ran back to the levee.

"Hurry!" Chip called after her.

He watched her running down the levee road until she was out of sight.

Left alone, Chip struggled to stay calm. It was only hours until high tide. He studied the marsh grass, trying to guess how high the water would rise. He tried to tell himself his head would probably remain above water. But he knew the height of the tide varied from day to day and with changing wind conditions.

To rest his arms, he stuck the butt of his gun into his shirt. The blood-congealing cold penetrated to his bones and his legs cramped from trying to remain upright. If he lost his head and began to struggle, he would be swallowed by the mud. Chip wondered if he had the iron self-discipline he would need until help arrived.

The sun climbed in the sky. From time to time Chip saw other hunters in the distance; none came within hailing distance.

His plight was one more in the series of mishaps that had plagued Chip and Betty, who met as seniors at Appalachian State University in Boone, N.C., since their marriage three months before. On their first night in California, during their honeymoon, a motel fire destroyed Betty's wedding dress, their marriage license and a number of wedding presents. Perhaps this was a bad omen shadowing their marriage.

As the sun rose higher, Chip realized that two hours had passed since Betty left him. He could no longer fight down his terror. The mud had reached his chest. At any time the rising tide could pour from the channel, flooding the mud flat and submerging him.

Worse, he feared something had happened to Betty. She might have been struck by a car, or hitchhiked and been assaulted. Frightening thoughts tortured him. He kept glancing over his shoulder at the threatening edge of the channel, and at the water-stained marsh grass at eye level.

After Betty left Chip, she hurried back to the levee and ran the half mile to the highway. By the time she reached it she was gasping for breath. She was overjoyed to see a farm about a mile away. Help was nearer than she thought.

She stumbled on to the farm. When she reached it, she discovered it was only a deserted building, surrounded by a fenced pasture in which horses and goats grazed.

She would have to hitchhike to a telephone. The prospect terrified her. But she couldn't risk losing time. As she ran along, tears pouring down her face, she put out her thumb. Some 30 cars passed her by. Finally one car stopped.

"My husband is stuck in the mud back there," Betty gasped. "He's in to his hips and he's sinking fast."

The dark-haired, heavyset driver, whose name Betty never learned, drove her to a telephone booth beside  
(Continued on page 25)



## PUBLISHER'S FORUM

**DENNIS E. KELLEY**

Ed Newbury of Alaska's Disaster Office reports that avalanches have been related to a layer of soot between the snow from the eruption of the volcano St. Augustine. . . . South Cardina's SAR Coordinator Jim Breznay is back jockeying a helicopter. Jay Rickman is holding down the fort. . . . Jim Lord of New York State Department of Environmental Conservation is preparing an article about Eastern SAR. . . . The World Health Organization reports that road accidents account for most children's deaths. . . . Congratulations John Macartney, new Chairman of Seattle Explorer SAR. . . . The California Region, Mountain Rescue Association white paper on membership qualifications by Drs. Lee Lucas and Carl Heller of the China Lake Mountain Rescue Group demonstrates that good will and progress are still possible together. . . . Rick LaValla, Washington State SAR Coordinator, announced that the Washington State Board of Geographic Names has approved the naming of an unnamed 7100 foot peak in the Olympic Mountain Range after Hal Foss, past State SAR Coordinator and founder of NASAR. Glenn Kelsey spearheaded this effort on behalf of his close friend for nearly 3 years. . . . Ben Pedrick, Los Angeles County Sheriff's Mountain Rescue Inspector has made the following appointments: Alex Kirkaldy Training Captain, Pete Lyman Communications Chairman and Bob Stiver Equipment Chairman. . . . The Virginia SAR Coordinator Norman McTague is busily preparing a State SAR Plan. . . . Rick Goodman, President of New Mexico's Emergency Services Council, agrees with Stan Bush, President of Colorado's SAR Board, who noticed that some SAR organization charts don't

have the victim at the top. . . . John Ralmon is busy preparing another script. This time for a film on emergency trauma care. . . . Lt. Robert Morse of the San Diego County Sheriff's Department and SAR Coordinator for the Search and Rescue Organization of the Californias (SAROC) has retired. He became involved in SAR in Baja because of his flying ability and knowledge of that rough Mexican terrain. After the successful 17 day search on Baja's Diablo Peak for 2 young Americans in 1967, Lt. Morse and Arthur Feldman, then U.S. Consul in Mexico, formed SAROC. With the retirement of Lt. Morse, the position of U.S. Coordinator of SAROC has been designated as Sgt. John Mander also of San Diego County Sheriff's Dept. . . . Bob Kohler is now Florida State SAR Coordinator, with Tom Nelson back in graduate school. There has been much news about all sorts of things like houses and trucks sinking into Florida "potholes." Is there a scuba search and recovery technology for "potholes?" . . . George Holey, Minnesota SAR Coordinator is retiring September 27, 1977. . . . The Idaho Mtn. SAR

Unit (IMSARU) Newsletter reports that Dr. Cameron C. Bangs' new film "Emergency Treatment of Cold Injuries" is excellent. Incidentally, Dr. Bangs is receiving a hero's award. . . . Lance Feilds, International Backpackers Assn. President, announced that in the bicentennial year 507,000 man-hours were volunteered for non-motorized trail preparation and maintenance. . . . Jean Syrotuck is still creative and helpful, even writing about poison oak. . . . Charles Manfred, Director of California's Office of Emergency Services has announced four 3-day training seminars covering all aspects of SAR to be conducted during the next twelve months. . . . Don Arner has published Bill Syrotuck's last book, "Analysis of a Lost Person - An Aid to Search Planning". . . . Western Rescue Journal Editor Walt Moore stated he has terminated direct financial support to State SAR Organizations in favor of a survival education library. . . . My apologies to Lyn J. Morgan for her authorless article in Spring 1977 SARM, "EMT Plan for Moun-

*(Continued on page 26)*

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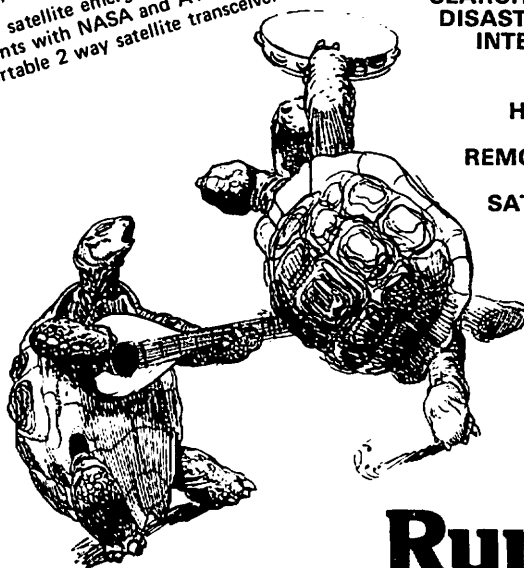
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## RACE AGAINST THE TIDE, *continued*

the highway about three miles away. He gave her a dime and waited for her signal that help was on the way.

Betty gasped out her story to a California Highway Patrol officer who tried to calm her and find out where she was. Betty could tell him only the highway numbers at a nearby intersection. "Wait for me there," the officer said.

As Betty scanned approaching cars, she felt as if time had stopped. She remembered the odd, uneasy feeling that had nudged her into coming with Chip that morning, and she tried to push from her mind the picture of Chip disappearing under the mud. Her terror and sense of helplessness became almost unendurable.

At last she saw a black and white car approaching. The driver, Officer John Lutzow, tried to calm her. They drove to the roadside area where Chip's jeep was parked. "Now, where's your husband stuck?" the officer asked. Betty pointed out toward the marsh.

Officer Lutzow radioed for another Highway Patrol car and a rescue helicopter from the Coast Guard base at San Francisco Airport.

Betty and Lutzow ran down the levee, searching the mud flat for some sign of Chip.

"Where were you sitting when this happened?" Lutzow asked.

"I don't know!" Betty cried. "I can't find my blanket." She was chilled by fear that Chip had already disappeared under the mud, and she sensed that Lutzow had the same thought.

"I'll go on ahead," he said.

Betty tried to keep up with him. She saw him stop three hunters headed for the highway and point toward the mud flat. The four men fanned out into the marsh, moving toward the water but staying within earshot of each other. Suddenly Lutzow waved his arms and shouted. Word came back: "We found him!"

Betty's knees buckled. She stumbled along the levee until she could see Chip's green and brown camouflage parka almost hidden among some dead trees. She trained her binoculars on him and saw to her horror that he had sunk to his chest. Her watch showed ninety-three. He had been in the mud for two hours.

Highway Patrol and sheriff's cars pulled up on a road beside the levee - someone had opened a gate back at the highway. A deputy sheriff snatched a rope from his car and struggled through the mud toward Chip as far as he could. A reserve deputy sheriff followed him with a rope from his four-wheel drive vehicle. But the ropes proved far too short. No one could do more than shout encouragement to Chip. "Hold on! There's a helicopter coming!"

Through the binoculars, Betty watched Chip gradually sinking. She wondered how much longer he could breathe against the crushing pressure of the mud. She looked at the edge of the channel. How soon would the tide flood the mud flat? Could they get Chip out in time?

At 10 a.m. Chip, out in the mud, heard the distant

*(Continued on page 29)*

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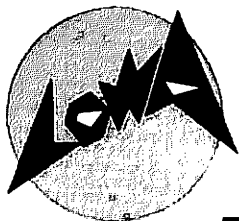
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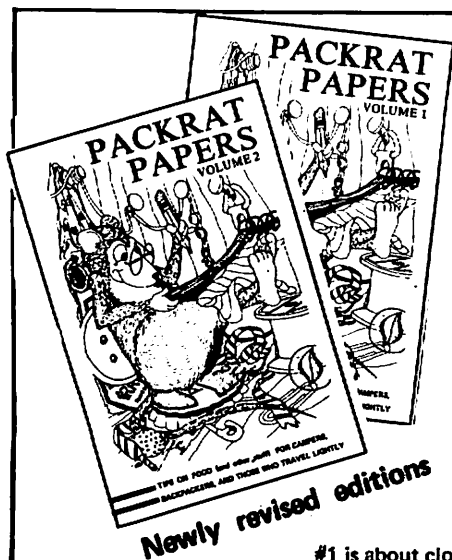
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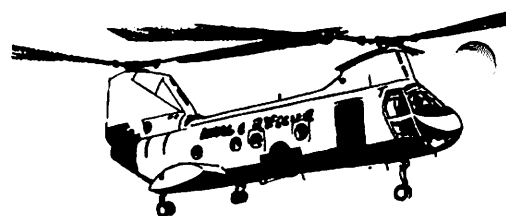
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FORUM, continued

tain SAR Teams". . . Col. Ryland "Roy" Dreibelbis former Director of AFRCC Inland SAR, Scott AFE has been assigned to Okinawa as Commander of 33rd ARRS. His replacement is Col. Bruce Purvine . . . Douglas M. Crouch, died in open heart surgery April 18, 1977. Doug was Managing Editor of "Search and Rescue" the official publication of the National Jeep Assn. He will be missed. . . Jack Kirklan, Missouri's new Dept. of Transportation Director appointed Ralph Hibdon of the Aviation Div. the State SAR Coordinator. . . . Harold Smith of Wyoming's Disaster Agency says Jake Herzog has retired to Oregon. . . May Day! May Day! The National Safety Council gave us "The National Disaster Survival Test," a 90-minute prime-time network television program that was the NBC "Big Event" on Sunday, May 1, 1977. Congratulations. It was fun and educational! . . . Blair Nilsson Colorado SAR Coordinator has been in Washington DC working with the National Science Foundation and the U.S. State Dept. on an International Disaster Response. . . Tom Holcomb of DOD's Defense Civil Preparedness Agency suggests peaceful disaster preparedness is a stepping stone towards effective defense preparedness. . . California Governor Jerry Brown has issued a directive establishing a Drought Emergency Task Force to be headed by the California National Guard Commander, Major General Frank M. Schober. . . Mike Kenard, Los Angeles County Sheriff's Emergency Services Detail was recently snakebit. We wish him well . . . Dick Mitchell and Gene Fear of Washington State have gotten together on two new publications: "Mountain Medicine Symposium Papers" and "Fundamentals of Outdoor Enjoyment". . . . Bill March's new book "Modern Rope Techniques in Mountaineering," which incorporates his older "Improvised Techniques in Mountain Rescue," is out . . .



*Robin Burton is a freelance writer and broadcaster on marine topics. He writes for various magazines in the United States and Britain and has practical experience at sea as merchant seaman and commercial fisherman. A keen sailor, he is especially interested in surviving!*



**by Robin Burton**

There are two main aspects of surviving in really cold water — protection from heat loss, and provision of suitable lifesaving equipment.

1,500 'survivors' of the Titanic disaster were found floating dead in the water when relief arrived, but most would have lived to tell the tale if they had known the basic principles of staying alive in an adverse environment. There were hundreds of cases of passengers and crew peeling off their clothes to swim 'better' on abandoning ship. This was just about the worst thing they could have done! The most important principle to be remembered when abandoning ship is that the maximum amount of clothing should be worn with suitable buoyancy, and the minimum amount of swimming should be done.

To understand the reasons for these rules it is advantageous to look at the bodily mechanisms responsible for heat loss or retention. It is generally thought that human body temperature remains constant at around 98.6°F but this is not the case. In fact, temperature is neither constant nor uniform throughout the body as there is an inner core maintaining approximately constant temperature surrounded by a temperature gradient to the body surface. The superficial layer is typically about an inch thick and the slightly varying core temperature may not extend into the limbs at all. It is well known, however, that the heart and brain need maintenance of a fairly constant core temperature. The three main factors affecting temperature balance are production of heat, loss of heat and evaporation. Radiation, convection and conduction all allow heat to escape to the environment and there is also loss by evaporation. Any form of exercise such as shivering will produce heat, but sweating at maximum rate can get rid of this as fast as it can be produced. The rate of heat flow is determined by the temperature difference between the body core and the outside environment, allowing for whatever lies between them. That means clothes of course. The total insulation between the core of the body and the environment consists of three main components: the surface layers of the body, clothing and the layer of air trapped on the surface of the body. There is a measure of insulation known suitably enough as the clo, of which one clo represents the insulation extent of the average man's clothing. If air is trapped it gives insulation of something like 4.7 clo for

# Survival in COLD water

every inch of thickness. Obviously clothing should be designed so that air is trapped between the fabric layers.

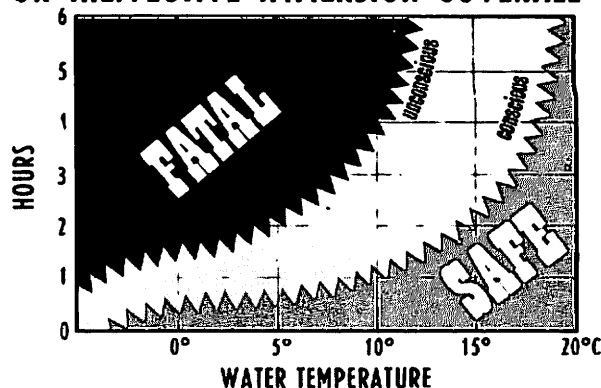
What happens when a man gets cold? Well, the hypothalamus is that part of the brain that takes care of the bodily control system and works in conjunction with blood temperature sensors and effectors. When a man gets cold his body control switches on some shivering to generate heat. Shivering can however lead to fatigue and a resulting drop in body temperature, and this means in certain cases that there is a time factor if heat is being balanced by muscular effort. No one has exactly defined 'exhaustion' but it is not simply a case of running out of energy stores.

In temperate climates humans have to do something about keeping up their temperatures because they tend to like relatively warm conditions, but although the body can get rid of heat well it finds it harder work to produce it, so there is obviously a need to wear the right sort of clothing.

How cold can a man get before he begins to die? A question he is unlikely to know the answer to until it is too late. It is not easily answered for people vary in characteristics, but as a general rule it is safe to say that a drop in core temperature of say 5°F is not dangerous, although it may be uncomfortable. If the temperature

*(Continued on page 28)*

## APPROXIMATE LIFE EXPECTANCY IN WATER IN NORMAL CLOTHES OR INEFFECTIVE IMMERSION COVERALL



MOHRER/HARBERT P.W. 1967



## SURVIVAL IN COLD WATER, *continued*

keeps going down then consciousness becomes clouded and shivering impaired and at 86°F external aid is necessary to survival. By the time the core temperature is down to 80.6°F the man is in pretty bad shape and a drop of another 3°F is likely to finish him off!

A man out of water is not in the same situation as a man in water for well defined technical reasons. A naked man in cold air can maintain his temperature by shivering as hard as possible (even if he cannot keep it up forever). The point is that he has to do something active. His only limitation, however, is the play of the cold air on his exposed flesh and if there is a strong wind he has a problem! Survivors of shipwrecks on the other hand are usually wet, which reduces the insulating value of their clothing. The clothing still has considerable value however and experiments have shown that subjects sitting still in cold water have their heat loss reduced by three quarters if they wear heavy clothing. This applied to volunteers sitting still in water for twenty minutes at a temperature of 41°F. The clothing keeps the skin temperature some four or five degrees above the temperature of the surrounding water. It pays to maintain every little bit of warmth as survival time is directly linked to water temperature. A man can just about maintain heat balance in a water temperature of 68°F. At temperatures above this, the warmth of the water is not the factor governing

survival times. At lower temperatures, however, the picture changes and a man who would last some ten hours at 64.4°F. would only make it for an hour or less at 32°F. The obvious inference from this is that anyone dropped into cold water should be hauled out as rapidly as possible!

The other main point at issue is whether a survivor should swim about in the hope that he will generate warmth by exercise. The short answer to this is that he should *not*. Swimming usually halves body insulation, and most people chill faster if they swim about. Only people who can combine muscular strength with greater than normal body fat can both produce and retain the extra heat. Thin people get cold much quicker than fat ones, and women, by virtue of their layer of subcutaneous fat, usually last longer than men.

There is a rather interesting phenomenon called 'after-drop' which all rescue teams should know about. The survivors' temperature drops swiftly after he has been taken from the water and many people have died at this stage, sometimes because they have been incorrectly treated. 'After-drop' is most likely caused by stagnant blood being pumped back to the core as recirculation occurs, so that treatment should be aimed at rewarming the core without boosting the peripheral circulation, to minimize the effects of 'after-drop'. The best way to do this is to immerse the trunk in a warm bath because providing general warmth would encourage dilation of the blood vessels in the limbs without warming the core. This may not be possible in an emergency, in which case the patient should be placed in a neutral environment so that his own metabolism can remedy the situation. Special cases may of course need special treatment to take care of changes in body fluid composition and volume. Also, special equipment, such as heated O<sub>2</sub> respiration units are revolutionizing this kind of resuscitation.

The question of what kills apparently normal people when they are suddenly obliged to swim in really cold water has occupied quite a bit of research. It appears that ventricular fibrillation or disorganization of heart muscle activity is often to blame. In various cold immersion studies, showers of iced water increased heart output as well as blood pressure, which together with an increase in frequency and depth of respiration could lead to inhalation of water with subsequent drowning. There are plenty of cases known of people who dove into swimming pools and floated dead to the surface. In quite interesting experiments, fit volunteers swam in cold water wearing clothes but without lifejackets. Some of them, including a champion swimmer, just went under. Most were okay a few minutes later but could not explain their failure! One factor was undoubtedly the high water viscosity which added to the amount of work needed to keep up. None of those concerned could keep going for more than about ten minutes. This of course is a very potent argument in favor of staying with that boat, even if it did capsize just a short distance from shore!

Another point bearing on this was made by Dr. J.

(Continued on page 29)

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## RACE AGAINST THE TIDE, *continued*

chop-chop of a helicopter. As the big orange and white Coast Guard craft approached, the pilot at first appeared to have difficulty locating Chip. Then he zeroed in. The helicopter made a preliminary pass over Chip. It returned and descended to about 15 feet above his head.

The helicopter's rescue man lowered a rescue basket from the side of the craft. Chip placed his gun in it and got a handhold on the basket. The crewman eased the hoist into action. The helicopter labored against the strain, but Chip did not budge.

The strain nearly tore Chip's arms from their sockets. He rested a moment, took a different grip on the basket, and the crewman gave the winch another turn. The blast from the rotors flapping over his head tore at Chip's face and his body vibrated. The suction of the mud pulled at him with terrifying force. Both arms aching, he changed his grip and the crewman tried again. At last the mud yielded.

Inch by inch, the crewman manipulated the winch to raise Chip. When Chip's feet were finally freed, the crewman set the basket down. Flooded with relief and gratitude, Chip climbed in. It seemed like the most wonderful moment of his life.

The rescue man hoisted the basket to the level of the helicopter's sliding door, then pulled it into the cabin. Chip crawled out, leaving mud on everything he touched. It had taken nearly 15 minutes to free him.

The helicopter landed on the levee and Chip stiffly climbed out. It was nearly 10:30.

Betty threw her arms around him, mud and all, and he hugged her in return.

"Are you all right?" she cried, laughing and sobbing with relief.

"I'm fine!" Chip said. He tried to cover his embarrassment with a grin.

"For awhile there I was afraid we wouldn't get him out in time," Officer Lutzow said.

"He was lucky," someone else said. "He didn't have much more time. It's a good thing his wife was with him."

Chip thanked all the men who had taken part in his rescue. The helicopter took off. One of the officers drove Chip and Betty back to their jeep.

To Chip, the world seemed washed with new brightness. Looking at his bride's radiant face, he knew that together they'd turn any bad luck into good. ❀

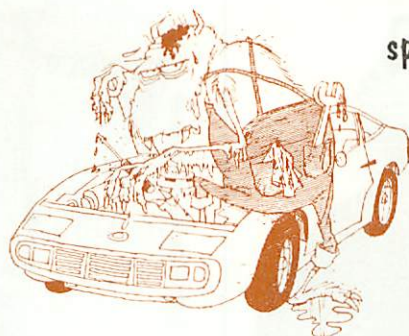
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## SURVIVAL IN COLD WATER, *continued*

Murray Young of the Royal Navy Institute of Naval Medicine who said that some people are what he called 'negative' floaters'. That is, they do not float easily or indeed at all! The trouble is that they are slightly more dense than sea water and so have to expend more energy than their luckier colleagues if they want to keep breathing.

The most useful advice for those likely to fall into cold water is to wear as much clothing as possible and swim as little as they can, not forgetting a good lifejacket!

There are many protective suits on the market, some with built in buoyancy or other devices. The man about to fall into cold water should remember two main rules: Don't swim about, and do wear anything which will restrict free flow of water around the limbs.

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Lacy E. Suiter, Treasurer of the National Association for Search and Rescue (NASAR), and Emergency Operations Officer for the state of Tennessee (left) presents the First Certificate of the NASAR order of the "Honorary Angels of the High Lonesome" to Mr. William Scripps Kellogg at the La Jolla Beach and Tennis Club.

Mr. Kellogg is one of the foremost supporters of search and rescue efforts in the world today.

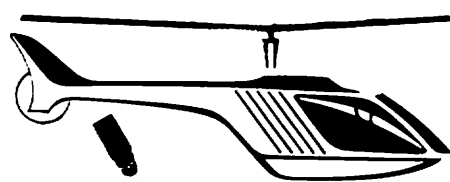
He is Honorary Chairman of the Search and Rescue of the Californias (SAROC). Principal Patron of the World Life-Saving Association and a charter Sustaining Member of San Diego Mountain Rescue.

Mr. Suiter said, "NASAR has honored itself by having Mr. William Scripps Kellogg as its first sustaining member of the 'Honorary Angels of the High Lonesome,' a group of public spirited citizens who are helping fund improved technology and life-saving systems for search and rescue today."

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