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MAGAZINE

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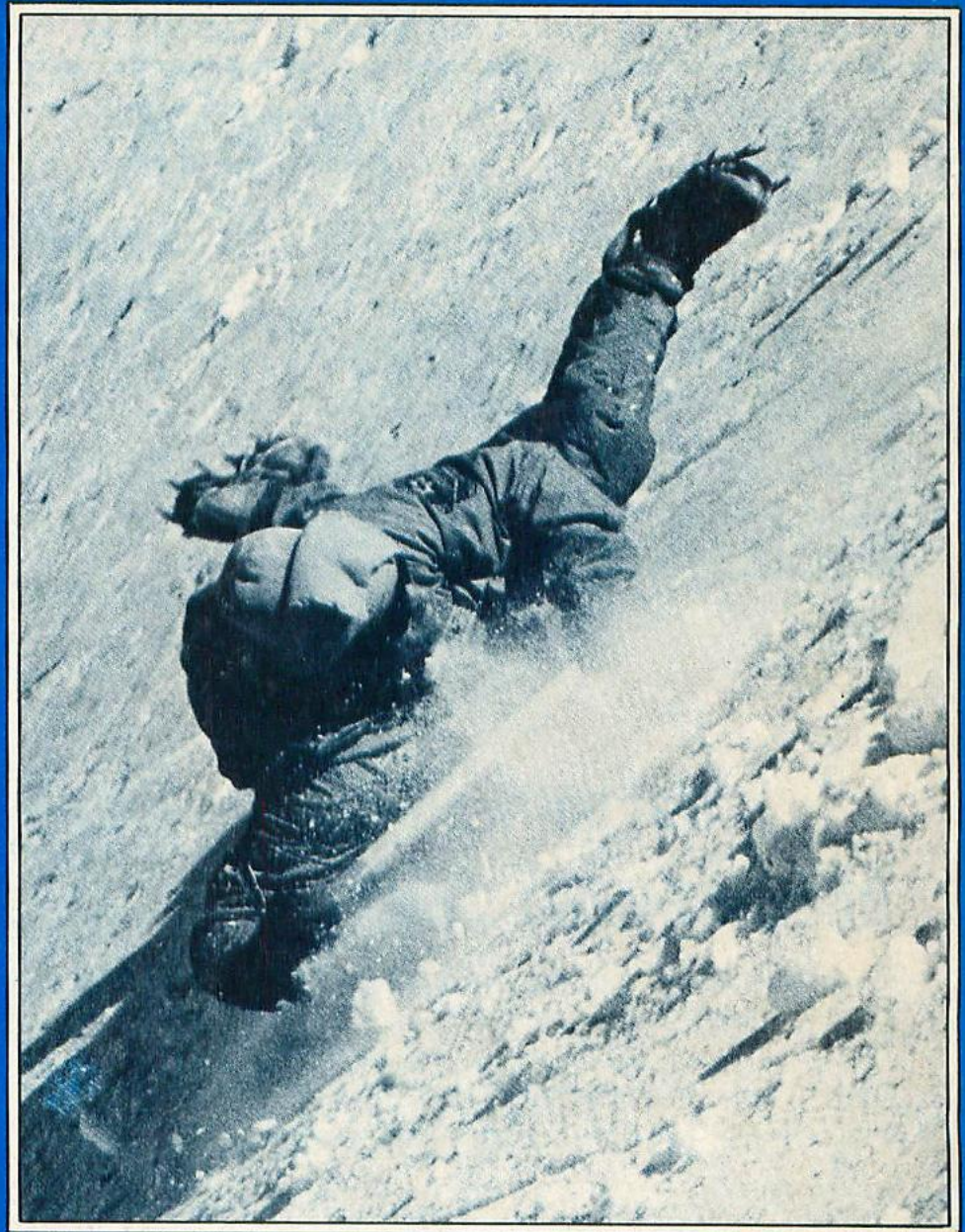
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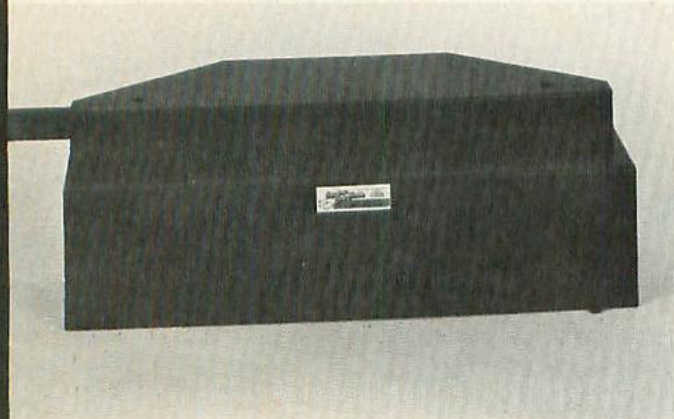
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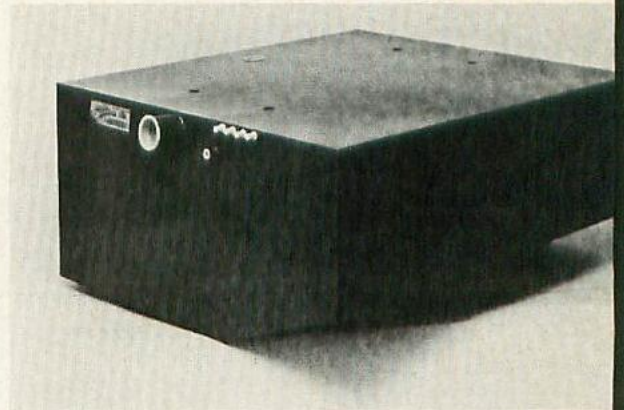
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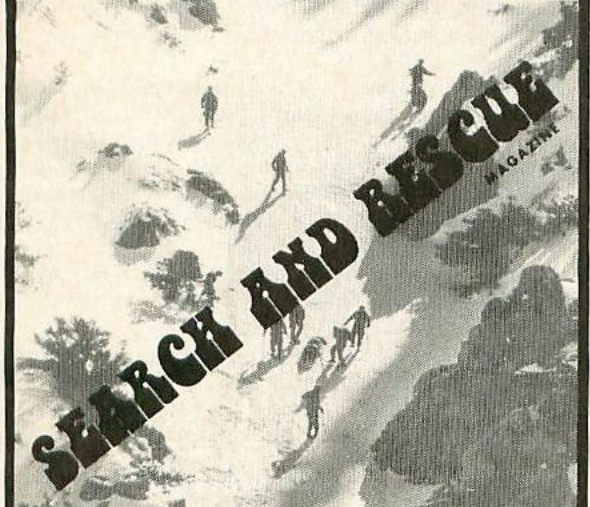
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# SEARCH AND RESCUE MAGAZINE

SPRING 1977

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Publisher ..... D. E. Kelley  
Editor ..... M. P. Sweeney  
Consulting Editors.....H. N. Humfreville  
Lois McCoy  
Advertising Consultant....Elyse Hodgson  
Production Consultant...Marion Christner  
Printing.....California Offset Printers  
620 W. Elk St., Glendale, CA 91204

#### CREDITS:

Cover Photo..... Dan Hensley,  
Montrose SAR  
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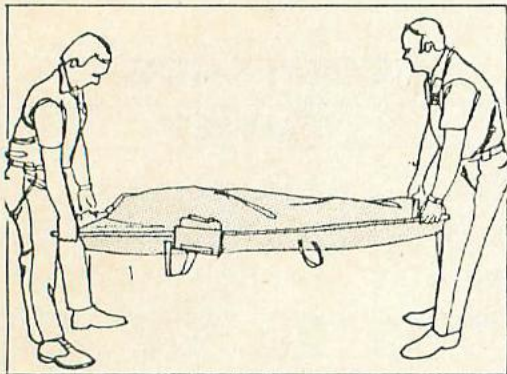
MANUSCRIPTS  
SUBMITTED FOR  
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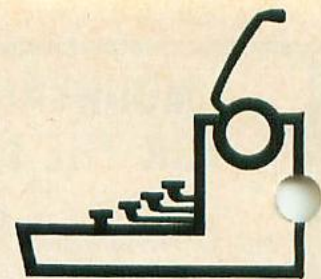
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## LETTERS TO THE EDITOR

Dear Editor:

I read with interest your recent disertation on developing a response system — (see *Fruit Salad Caper*, this issue. From my limited perspective I offer these comments.

I fully agree with your “fruit salad” concern. There is an axiom in geometry which states “The whole is equal to the sum of all the parts.” Unfortunately geometric theory does not pertain to search and rescue. While we often find large individual efforts in most missions, a careful analysis would also indicate that many of these missions are not mutually supportive. This occurs not only between agencies and jurisdictions but also between elements of a single organization. The result is a product whose total effort is much less than the sum of all involved.

So therefore my answer to you is, no, we do not have a national system. Further we will not have a system until we have an organization, and not have an organization until we develop a need and not develop a need until we diagnose the situation and develop a problem.

Through our own eyes we perceive ourselves as responders — as life-savers — all as vital ingredients of your fruit salad. However, to agency directors and administrators we often appear in a different light. We are sometimes perceived as reactors, people who are crisis oriented rather than solution oriented. So we’re also the rinds, and the pits in your salad.

Few governmental agencies have expended any effort to clearly define the SAR problem. Likewise little SAR effort is expended to prevent the problem before it happens.

As you well know, we are on unstable ground in dealing with federal agencies, in proposing a solution until we can adequately define our problem, and justifying that problem with the numbers.

We are often envisioned as Don Quixotes fighting windmills and the embarrassing point is that we can’t even describe the windmill.

If we are to be united and progressive let’s start by fighting one large windmill rather than 1000 small ones. Pure logic tells us that it should be easier to describe a single element rather than 1000 small ones. Press on.

Andrew L. Hutchison  
Assistant Chief of Protection  
National Park Service

Editor—

Have you ever considered an article regarding the application of a “seer” for searches? This is a problem which has occurred to me and I’d like to see what others feel about this technique.

P. O. Bismark  
Sussex, England

Mr. Bismark:

*Yours is an idea we’ve been toying with — but gathering information is difficult. If you’re interested in writing an article and have factual material, please let us know.*  
Ed.

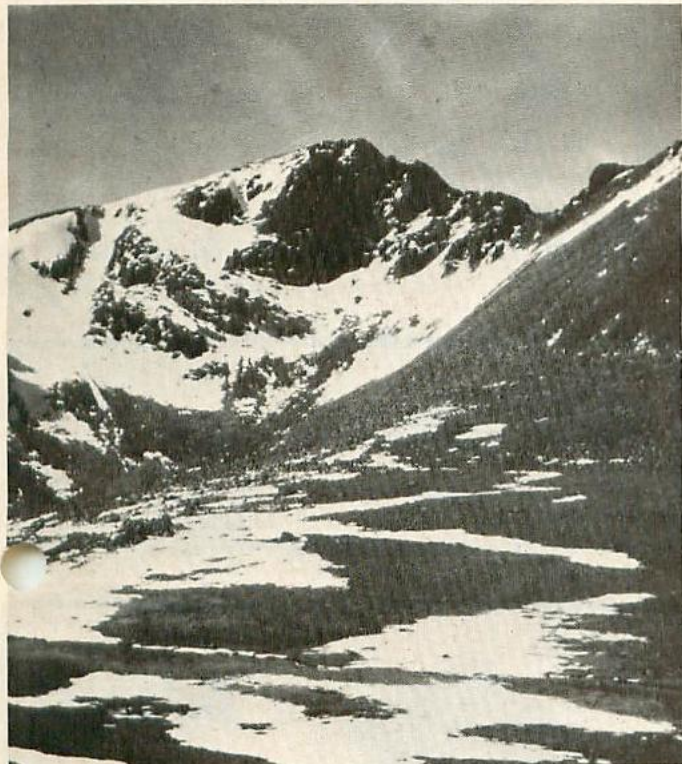
(Continued on page 14)



# BASIC SNOWCRAFT



**BILL MARCH**



The Fiacalle Ridge of Coire an Sneadh, Cairngorms, Scotland. Several people have been killed on the left hand snow slope because of the dangerous run out.

In many popular backpacking areas, especially in the spring and early summer, the mountain traveller will face the problem of crossing open snow slopes of varying degrees of steepness and difficulty. In the mountains of Scotland where winter hillwalking is a popular activity, the major cause of accidents is slipping on snow and failing to arrest the ensuing slide. Snow covered terrain is a different environment and requires knowledge and experience as well as technical competence in the use of the ice axe. The purpose of this article is to consider some of the problems presented by snow fields and to suggest an outline of the basic skills of movement and self-arrest with an ice axe which will prepare the backpacker for this type of terrain.

## **crossing snowslopes**

When a snow slope is to be crossed there are many factors to consider: the condition of the snow, the angle and form of the slope, the runout of the slope, the experience of everyone in the party, the foot-

wear, and finally whether or not ice axes are carried. In the spring the snow is normally old or firm snow which, when frozen, gives a firm walking surface. Snow conditions may be different either side of a peak, in sun and in shadow, with the time of day, and of course, with the weather! Level snow fields and easy angle slopes are comparatively easy to cross when hard; if they are soft, the going underfoot becomes very difficult especially when carrying a pack. Walking through wet soft snow on an irregular base i.e., over a boulder field, is also potentially hazardous as one can easily twist an ankle. Even more tiring is crusted snow when only the surface layer has frozen and is not quite thick enough to bear the walker's weight. In these circumstances of 'breakable crust' the snow sometimes holds the walker's body weight and sometimes does not. These snow conditions can be exasperating and extremely tiring.

The angle and shape of a snow slope should also be considered before deciding to cross. The steeper the slope the more difficult it will be to cut steps with an ice axe and the faster will be the acceleration if you fall, leaving you less time to self-arrest. Any slope over 35 degrees should be regarded as a steep slope. When the slope is concave any potential fall will be slowed and the runout can be observed. On the other hand a convex slope gives increasing acceleration in a fall and the runout is obscured.

*(Continued on page 11)*



Traversing steep snow slope on the Grand Teton, Wyoming. Note upright stance and axe in uphill hand.



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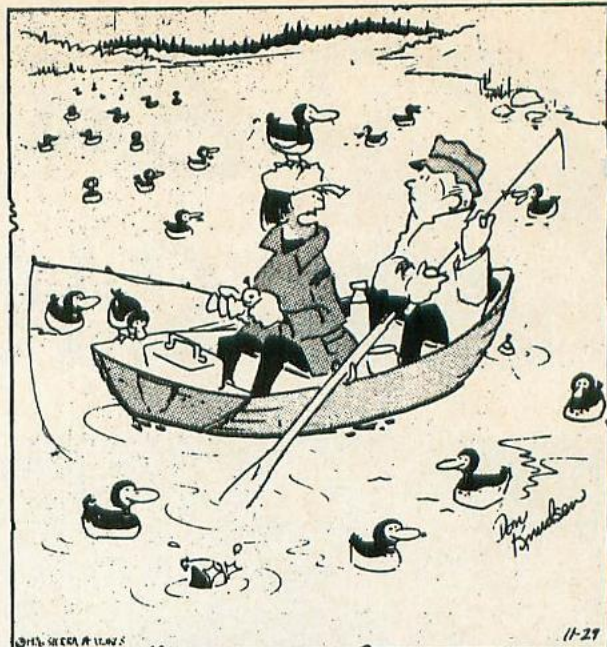
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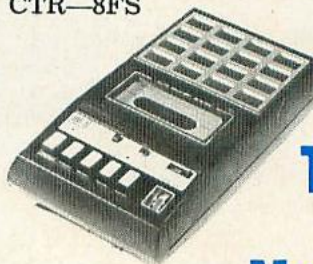


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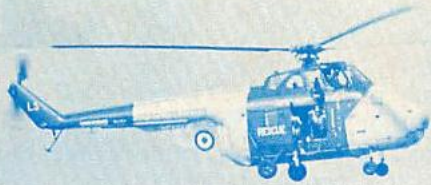
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# EUROPEAN

## search & rescue

ROBIN BURTON



The European search and rescue set-up is a rather fragmented but efficient affair consisting of helicopter squadrons, lifeboat services and various armed forces units working on demand. In this article the British organization will be looked at in some detail for it is vital to the whole effort off western Europe and incorporates several successful techniques.

The British Department of Trade requires that the United Kingdom set up – under the terms of the Convention on the High Seas and SOLAS – a search and rescue organization. This means cooperation with neighboring states and also that coast watching and rescue facilities have to be set up in such a manner that they take account of local traffic. The SOLAS Convention also obliges masters of ships to lend a hand, even to the point of taking over ships if absolutely necessary. But this is almost never done as most mariners are only too willing to go to the assistance of others less fortunate than themselves.

To look at facilities it is probably most logical to start at the coast and work outwards although it is impossible to set precise limits to the various spheres of influence of the services involved.

Close to home the familiar red and white painted lifeboats do a good job on limited resources. Broadly speaking these boats operate up to about thirty miles off shore and consist of several different types of vessels. The Lifeboat Institution is split up into nine different areas and there are 135 lifeboat stations including 54 at which an inshore boat is available. In addition there are another 66 inshore lifeboat stations. This fairly considerable fleet of inflatable boats is reduced during winter as the high speed inflatables are regarded mainly as an efficient means of saving yachtsmen who tend to hibernate in winter. The inflatables are kept ready for swift action and can skim across the sea at thirty knots if necessary but they would not be used for offshore work in really bad weather.

The offshore lifeboat fleet is varied and ranges from the 71ft Clyde class built of steel through the Arun, Thames, Barnett, Oakley, Waveney, Liverpool and various Watson types which may individually be built of wood or grp although steel is increasingly used nowadays.

The 35ft wooden Liverpool boat will do seven knots at full speed with a range of 140 miles. The big Clyde class will do eleven knots with four times the range but fastest of all is the 44ft Waveney. This was built to a USCG design and introduced to Britain some years ago with considerable success. It will do fifteen knots at a range of 167 nautical miles and like all the other vessels has its own particular uses.

All RNLI boats have some common characteristics. They have twin diesel engines. They are built to take the ground, (have their propellers housed in tunnels to avoid damage), and are built to a standard in excess of Lloyds requirements for A1 classification. They are not all exactly the same, however, and some are meant to stay at anchor. Choice depends on the area involved.

The Lifeboat Institution gets its money from the public by voluntary donation and this seems to work very well although it never seems to get as much as it needs! Shipowners also throw in a bit of cash and as a result the Institution last year managed to save from the sea well over a thousand people, without losing a single crewman. There were 2,876 calls for service.

The Institution is widely regarded as having a lot of expertise and acts as a sort of clearing house for international information on lifesaving activities. Bermuda, Spain and South Africa for example have all followed the RNLI lead and a central operations room is now being set up in Poole on the British south coast where direct links with other countries will be maintained.

*(Continued on page 8)*

Most of the lifeboatmen concerned are very capable men although they do not necessarily have any formal qualifications. Choice of crew is made on personal qualities and it sometimes happens that the men have their own ideas as to how things should be run. In one or two cases breakaway groups have formed their own small services but most lifeboatmen stay with the system.

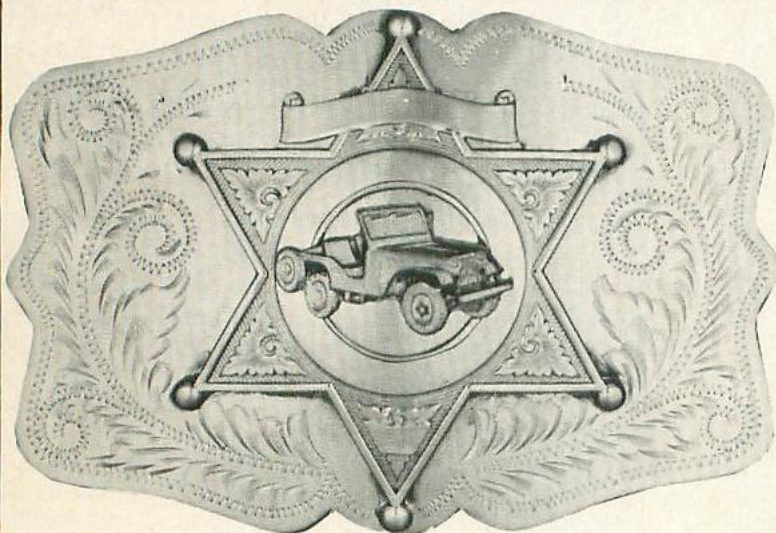
Modern lifeboats are extremely sophisticated affairs. They have echo sounders, radar scanner, Decca navigator systems, and a whole bundle of radio equipment for listening in on distress signals and talking with other ships and aircraft. VHF is used to talk with coast guard, coast radio stations, SAR units such as helicopters and Royal Navy ships and any other ship which happens to have the facility. A listening watch is kept on 2182Khz and there is a main MF receiver which can be tuned up to nine different channels for transmitting and eleven for receiving. Most modern lifeboats have a radio direction finding loop which enables them to take bearings or latch onto a casualty. This and radar are now pretty standard fittings. The fact that all lifeboats both inshore and offshore are fitted with VHF(FM) radio-telephone equipment and all offshore lifeboats are also equipped with MF radio-telephone equipment means that they can talk with most other units involved in a rescue operation. The simple principle involved is that the channel or frequency

used should always be one that everyone else concerned can use unless the information is of limited value. A British lifeboat launches into service with radio tuned to MF 2182KHz and VHF Channel 16 unless other arrangements are made. She has the capability to talk to a whole range of other units such as the casualty, Royal Navy warships, merchant vessels, RAF vessels and helicopters. At this time she cannot talk direct with USAF helicopters but this is being remedied. In addition a lifeboat always carries loudhailer, signaling flags, compass and the leadline familiar to most good seamen.

For close work then the lifeboat is still largely unbeatable. 'Scramble time' is very short and most boats are launched within some three minutes while a helicopter would still be 'winding up.' There are obvious limitations and helicopters have in recent years become much more widely used for rescue purposes, especially if they happen to be close to the scene of an emergency and are on permanent standby duty. They are faster, but they do have their own limitations such as the number of rescued they can carry and length of time they can stay in flight.

Royal Navy and Royal Air Force SAR resources consist mainly of helicopters and maritime patrol craft supplemented by other aircraft and vessels as necessary. Military aircraft give SAR assistance when needed and regard it as useful training for crews. Most of the SAR flights are RAF and located at approximately 100 mile intervals that form an over-

(Continued on page 9)



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lapping chain around the coast of Britain, reinforced by USAF 'Jolly Green Giants' and helicopters. An F Nimrod aircraft is constantly on standby for SAR work around the United Kingdom or in the eastern Atlantic. This can fly out to a point 1,000 nautical miles from base and search around for two hours before having to return. This range would of course be longer if the search time could be reduced by the use of Emergency Position Indicating Radio Beacons (EPIRBs). The question of use of these is a rather emotive one because there is some doubt as to whether they should work on marine or aero frequencies. Some SAR professionals seem to think they are not a good idea. The Chief Inspector of Coast Guard for example feels that it would probably be better if a radio telephone were used by the man in trouble to give his rescuers useful information. The trouble with useful information is that in order to give it one has to have it in the first place. In a recent incident involving a ship called the GOODWILL MERCHANT the ship was finally found 28 miles from where she thought she was and a simple homing device listening to a beacon could have saved a lot of effort. The Coast Guard however, unlike the armed forces, does not have radio direction finding apparatus and thus could not use such a signal to get cross bearings. It is the Coast Guard who tie up all the rescue package and unlike the USCG they do not normally go to sea.

One of the great virtues of the RAF Nimrod air-  
ne is its ability to drop SAR equipment packed in three cylindrical containers roped together. The biggest package contains a nine-man life raft which inflates as soon as it hits the water and there are various aids to survival in the other cylinders such as water, food, first aid kit, signaling equipment and so on. The plane is also fitted with illuminants to illuminate the deepest gloom.

Other RAF airplanes such as the Shackleton, Vulcan and Hercules also take part in aerial searches and all long-range maritime patrol craft can use a very wide range of radio frequencies such as 2182, 3095, 5680 and others.

The RAF also has several marine craft units located at strategic points and these can talk either on 243MHz or 2182KHz so that they can contact either a ditched pilot or a sinking mariner.

It is the helicopters which give the RAF its most useful SAR facility in near waters and Mark 10 whirlwind's are dotted around the coast together with a few Wessex. It is possible to put a chopper into the air at fifteen minutes notice. (That is, during daylight.) They are of limited use at night as a pilot hovering over the sea quickly becomes disoriented if he can see neither horizon nor fixed objects. Night flying is generally taken care of by the Sea King helicopters stationed at each end of the country and able to get off to a call within some twenty minutes.

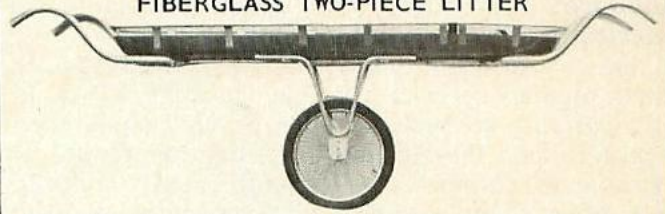
ese choppers have a range of 230 miles and can seat eleven men but accommodate considerably more. Both RAF and RN helicopters can talk with lifeboat coxswains and are piloted by extremely

(Continued on page 10)



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capable men. One pilot received a medal for making fifty-two flights with a tiny Wasp helicopter to rescue sailors from a sinking Turkish warship. An 'horizon' was formed in the darkness by sailors with torches and it is easy to imagine how nerve wracking a task it must have been. Accidents are few and one Royal Navy officer told me that he could not remember the loss of a pilot in recent years.

I have mentioned that the Coast Guard usually lashes together the whole rescue package. This is not invariably so because when Service assistance is called upon the Rescue Co-ordination Centre at Pitreavie in Scotland or in Plymouth usually controls the incident, keeping the Coast Guard informed. The 'On-Scene Commander' is nominated by the Coast Guard and is not necessarily the first SAR unit to arrive on the scene. It is not usual policy to switch from one Commander to another during a rescue and usually the aim is to activate the unit with the best facilities. This could be a merchant ship, a warship or the pilot of a search aircraft. Sometimes the pilot of a Sea King will do the job, for example.

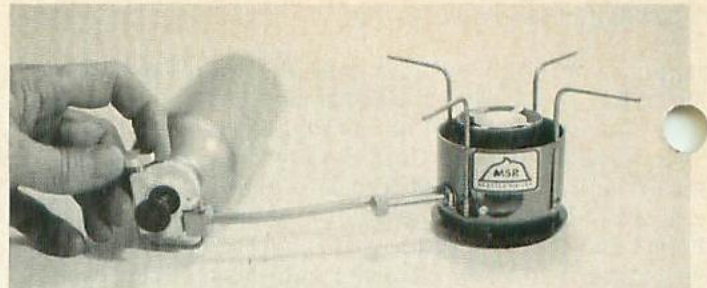
Most of the 600 Coast Guards dotted around the coast can communicate with their opposite numbers in the United States and Canada as well as western Europe. There are 159 Regular Coast Guard Stations backed up by various auxiliary stations and these keep radio, telephone and visual watches. There are also patrols with Land Movers and boats and that curiously British phenomenon the 'volunteers' who make a really useful contribution with what other countries may perhaps label 'amateur' activities.

There tends to exist among the public a rather quaint notion that a coastguard is a picturesque old guy with a wooden leg and a telescope, which is not true now if it ever was. At one time coastguards were widely recruited from ex-Navy regulars seeking a snug berth ashore. Nowadays appointments are made on a much more sophisticated level, which does not mean however that your friendly local coastguard will reach for a book of rules before a rope. It means that he is probably well qualified in navigation and will be accustomed to thinking in terms of disasters 1000 miles off to sea, well beyond the reach of the average telescope!

Any examination of the rescue organizations involved would of course be incomplete without mention of the USAF 67th Aerospace Rescue and Recovery Squadron. Based on Woodbridge in Suffolk, this squadron has five 'Super Jolly Green Giants' and seven HC 130 Hercules. The 67th belongs to a service which is said to carry out upwards of a hundred rescue missions every 24 hours throughout the world.

The Woodbridge aircraft range in area stretching from Northern Newfoundland to Bombay which means that given enough time they can rescue a man almost anywhere in the Atlantic or waters off the British Isles. I said given enough time because the Hercules is not fast. As primary squadron workhorses they have a normal airspeed of 320 knots and a scramble time of around half an hour although in practice they often lift off ahead of this. With an endurance time

(Continued on page 15)



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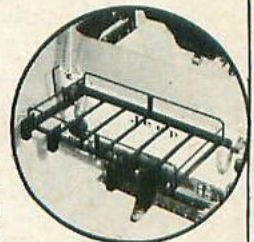
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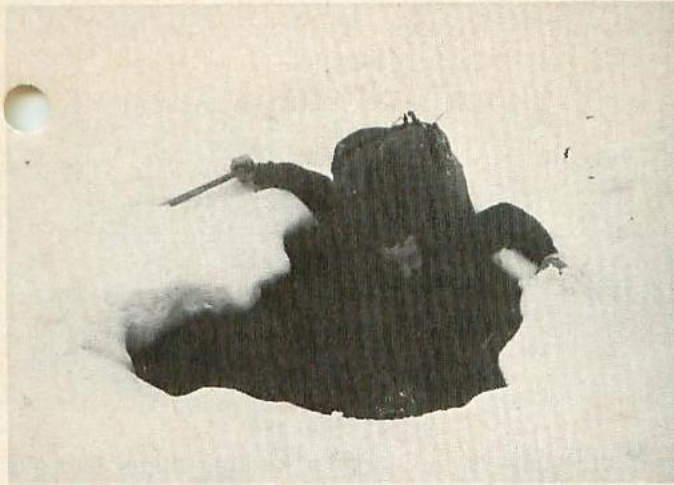
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### Slope runoff

The runoff of a slope may be regarded as the fall line direction and one should always examine this carefully before crossing. A concave slope with a full snow-covered runoff is much safer than a uniform slope ending on a boulder field or a steep drop. As one veteran Scots mountaineer once told me 'it's not the slide down the snow, but the rocks stopping at the bottom which causes the damage!' Many people have survived long falls in snow because of safe runouts and many have been injured or killed in

short falls over poor runouts.

Small snow patches present a less serious problem than extensive snow fields, but one should be careful as they often are fringed with a skirt of ice caused by alternate melting and refreezing. The ablation of snow fields also causes rind klufts — gaps between the snow and the adjacent rock. Large boulders protruding from the snow may be fringed by an area of thin snow as the heat of the rock has melted the surrounding snow. A greater hazard is found where stream beds are completely snow covered and the stream has hollowed a tunnel under the snow which the unwary walker may fall into by collapsing the roof. In these instances an ice axe is useful to probe the snow depth.

### proper boots

The decision whether or not to cross snow slopes depends greatly upon the equipment and experience of the party. Mountaineering boots have a rigid vibram sole and thus are ideal for step kicking in hard snow and providing a firm platform for standing on small steps. Hiking boots have flexible soles and are less efficient for snow travel; however, they are adequate for most situations. On no account should sneakers or soft flexible shoes be worn on snow slopes as they afford little security. The possession of an ice axe is mandatory for any person contemplating crossing extensive, steep snow slopes. This should be combined with a knowledge of the basic techniques of movement on snow.

(Continued next page)

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### kicking and cutting steps

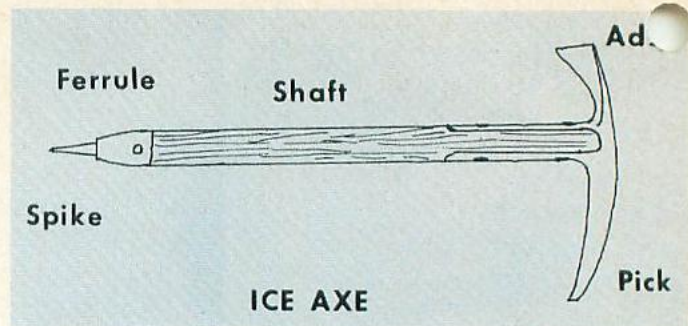
The basic techniques of movement on snow includes the ability to kick steps up, down and across a slope, to cut steps with an ice axe, down and across a slope, the ability to self-arrest – to stop a fall by using the ice axe as a brake, and the ability to do a controlled glissade. These basic techniques should be combined with a knowledge of snow conditions and a sound judgment of one's abilities and limitations. There is no substitute for practice and experience.

The ice axe is the basic tool for snowcraft, and some consideration should be given to its purchase. There are many different designs on the market, some for the specialist ice climber, some for the general mountaineer. The backpacker requires an axe with few refinements – it should be long enough so when it is held in the hand by the walker's side the tip or spike should reach the ground. A sliding wrist loop attachment is optional on most axes and may be removed or retained depending on personal preference. The axe may be carried in a variety of ways, either strapped on the rucksack spike uppermost with special attachment straps or it may be slipped between the back and the rucksack. This latter method has the advantage that it is easily available if needed without taking off the rucksack; all the walker has to do is reach his hand over his shoulder and draw the axe out like a sword from a scabbard. When travelling with an ice axe it is wise to cover the pack and adze with a protective case and the spike with a rubber bag and this will prevent injury from these sharp points.

#### the ice axe

When one is carrying the axe in the hand always bear in mind it is a weapon and do not flail it around like a toy – you may poke the man behind in the eye. The axe can be carried under the arm spike forward like a gun or it can be used for a walking stick with the pick pointing to the back and the adze forward. It is important to keep the pick pointing back as the axe is then in the correct hand position for self-arrest. The axe can be used as a third leg or support when kicking steps in hard snow. The axe should be driven in before the steps are kicked so in the event of a slip it gives additional support. Steps across a slope are kicked with a forward motion of the foot using the edge of the sole as a cutting edge. This side step can be used for traversing, zig zag, and diagonal ascents and descents which are less tiring than straight up ascents. One kick should suffice; if another is required it is probably better to cut a step. To ascend directly up a slope kick straight into the slope; to descend directly down use a straight legged plunge step and dig the heel well in. In descent, avoid rocking the body forward, thereby causing the step to slope outwards. Always maintain good balance and stand upright, cultivate a rhythmic movement, avoid long stretches, and emphasize movements. Step kicking in soft snow is hard work and the leader should be changed periodically. The party should be spaced out so if one falls he does not collide with and dis-

lodge someone else. On breakable crust it is often better to shuffle, thereby preventing a breakthrough. Deliberately breaking the crust with hard steps avoids inadvertant collapsing.



#### using the axe

If the snow is too hard for kicking steps then the axe should be used to cut steps. Normally one blow of the adze is sufficient to slash a side step for the foot. Always cut across the slope, not into it and do not try to cut too big a step as the axe will stick. When larger steps are required, cut a small piece out and enlarge it by cutting into one edge. Always cut into the step, not away from it. Slope the floor of the step into the slope and make it big enough for the whole foot.

The fundamental rule in step cutting is 'conservation of energy.' This is achieved by a combination of good balance, good rhythm and a full arm swing when cutting. Good balance is achieved by the correct positioning of steps, always standing on two feet when cutting, and avoiding leaning into the slope. A good rhythm is harder to attain and one requires experience of the different snow types – adjust your cutting power to the snow, develop a set sequence of movements, and remember not to cut while moving. The full arm swing is from a fixed shoulder; there should be no accompanying body swing and the axe should be allowed to do the work. The best way to learn an efficient method of step cutting is to practice on a slope with a safe runout.

Only occasionally will the backpacker come across ice patches and he should avoid continuous ice slopes, as self-arrest techniques are not very effective in the event of a slip. When cutting across an ice patch, use the pick of the axe and cut a line of horizontal blows along the line of the step, then cut down from above and clear the step with the adze. It is very important to slope the step inwards as vibram soles are very slippery on ice.

(Continued next page)

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### arresting a fall

Perhaps the most important skill to be learned in basic snowcraft is the ability to arrest a fall or slip using the ice axe as a brake. It is the level of this skill which will determine whether or not a person can safely cross a snow slope with a dangerous run-out. One should always ask and be able to answer the question 'Can I self-arrest on this slope?' In the self-arrest position the walker holds the axe diagonally across the chest with the upper hand over the axe head, pick held forward and the other hand covering or close to the ferrule and spike. On the first practice one should adopt the braking position sitting down and facing out on a snow slope with a safe runout. Lift the feet to initiate a short slide, rotate the body towards the upper hand holding the axe head by throwing the opposite leg over and in one body movement begin to drive the ice axe pick into the snow. Do not attempt a sudden movement. Apply the elbow of the arm holding the axe head first and slowly drive in the pick to avoid the axe being wrenched from your grasp. The degree of pick penetration can be controlled by twisting the wrist. Remember to bunch up over the axe head and use knees and feet as additional brakes. Keep the feet apart for stability. Once the correct procedure is mastered one can practice faster and more difficult slides and gradually develop the ability to self-arrest. The practice must be progressive in order to achieve a

reasonable level of competence. This should be practiced first without and then with a rucksack.

This level of competence is probably sufficient, although there are other more difficult practices which include correctional procedures if you are falling head first on your front or back and if you are rotating. A person falling head first should hold the ice axe horizontal across his front and drive the pick in the snow well to one side. This will rotate him around to the feet first position where he can self-arrest. If you are falling on your back head first hold the axe horizontally across the hips and drive the pick into the snow at the side of the hip, bend the knees and try and touch the adze with the forehead. This will result in the body rotating around into the feet first position. Correction of rotation is achieved by throwing open the arms and legs to counteract turning movements. There is a degree of risk in these training procedures and it may be advisable to wear a helmet and obtain instruction. The more difficult the snow slopes you wish to cross, the greater the technical ability required. At some point the backpacker will realize he is crossing into the realm of the mountaineer and a knowledge of crampons and ropework will be deemed necessary. ■





of 15 to 20 hours they can act as flying gas tanks and refuel their 'Jolly Green Giant' colleagues in mid-air. Control is exercised from Ramstein in Germany but once aloft all decisions are left to the aircraft captain. The most likely limitation of these aircraft is fog or wind as a cross wind of sixty knots could prove dangerous and no one would want to take off blind. Fortunately Woodbridge tends to suffer little from either of these two problems.

The 'para-rescuemen' are a useful feature of the American service and fulfill virtually the same role as their Royal Navy colleagues who are quite prepared to plunge into the sea if necessary to provide assistance.

Some idea of the sort of effort put into rescue operations this side of the Atlantic by the USAF is given by looking at the rescue of a man with an injured eye from a ship 300 miles off Ireland. The man was lifted off by 'Jolly,' transhipped at Cork and flown to Cambridge in England for treatment where his sight was saved. Not a cheap operation when one considers that there are about fourteen maintenance men to every flier and about 300 men are permanently employed in the squadron.

Communication between British and US SAR personnel is good if one considers that the last technical problems with radios, etc. are now being ironed out. One small snag is the different idioms employed by the pilots. An American, asked if he would like more bacon and eggs, may well reply, 'that's alright,' meaning yes. An Englishman may

well take the reply to mean no, and if one substitute lifebelt for bacon and eggs it seems there may be room for slight uneasiness at times.

The waters which pass beneath the wings of USCG aircraft meet with those covered by the RAF and the 67th ARRS and there is good over-all integration of effort. This does not mean however that there is not room for a bit of tidying up. This now being undertaken by the Inter-Governmental Maritime Consultative Organization's group of experts in London. The group, chaired by Commander A. McCullough of the United States, is working on ways of interlinking various national efforts to avoid wasted resources and loss of time in the event of emergency. Positive action is expected to be recommended some time during 1978 and a draft of a proposed Maritime Search and Rescue Manual has already been considered. Preliminary work on the Manual is expected to be completed by next May and since such rescue operations normally involve aeronautical as well as maritime services, the manual has been aligned as closely as possible with the Search and Rescue Manual of the International Civil Aviation Authority. This could mean a slight reshuffling of present procedures but it is not intended to upset the healthy working relationship currently enjoyed by rescue workers on both sides of the Atlantic. ■



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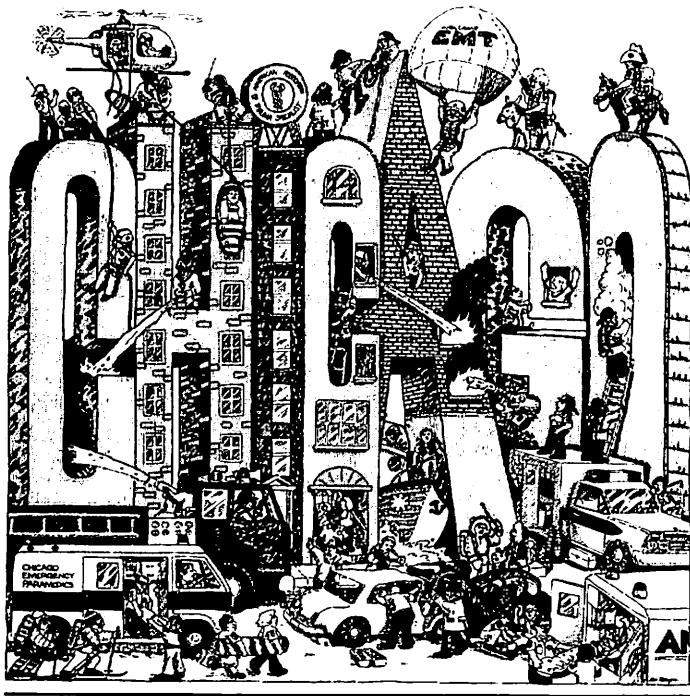
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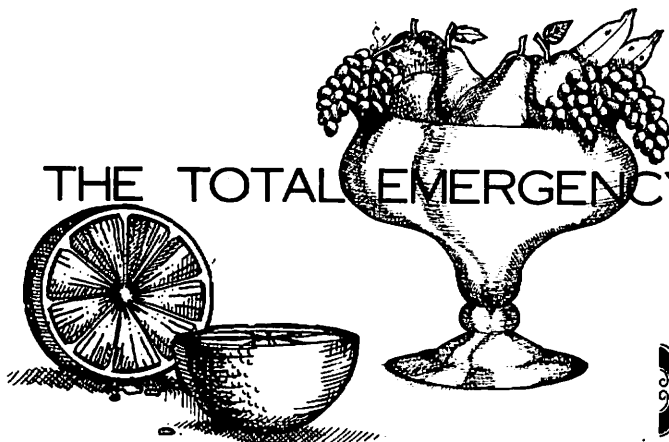


A MYSTERY STORY

# the **FROXY SALAD CARP:**

OF

WHAT HAPPENED TO  
THE TOTAL EMERGENCY RESPONSE SYSTEM?



by  
**Nois Clark McCoy**

Are you a policeman, fireman, EMT, mountain rescue member, jeep posse member, Army helicopter pilot, civil defense disaster card holder, sheriff's reserve, Air Force reserve, mine rescue, CAP, Coast Guard, Highway Patrol or National Guard Pararescue?

If so, you all have one thing in common. You are responders to emergency humanitarian distress.

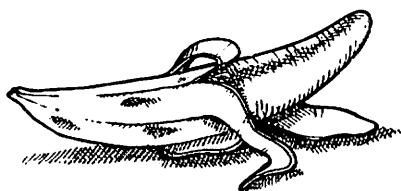
And, as such, you are a part (so to speak, the "hands on" part) of a total United States Emergency Response System. We believe you function very well. In fact, sometimes "super good".

As "responders," as "resources," you are a part of an emergency system. But does the United States really have a Total Emergency Response System?

I know we have all those emergency resources to which you belong, but where do we fit into this (functioning?) multi-mission, cost-effective, efficient system which impacts death and disability?

And, if we don't have such a system, why not?

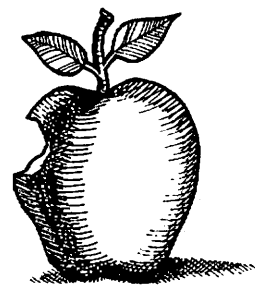
Sometimes, either because of great need or small profit, systems grow and proliferate to assume necessary responsibilities. What we come up with is - to paraphrase Mr. Spock of *Star Trek* - "not logical". We come up with emergency ambulance responders, aircraft crash-locator responders, burn trauma centers, disaster workers - i.e. apples, oranges, pears, and bananas, -each responding to his special emergency.



But, what if the emergency is an aircrash, caused by extreme air turbulence in tornado conditions, over the metropolitan area of Oklahoma City, involving fire on impact?

Then the apples, oranges, pears, and bananas all respond together - hopefully upon immediate notification.

If it is only a few people, it's a "Rescue." But, if it's a lot of people, it's called a "Disaster". And here is where our total emergency response starts to unravel.



Where is our system to make a tasty fruit salad of all our different responders? Each one with it's "orange" communications frequencies, "apples" chain of command, and "bananas" operation plan?

Each of us responds to the same humanitarian need of emergency distress, but there is no system linking us together.

From rescue to disaster is an escalation in numbers, quantity, proportion and stress - stress on people, equipment and resources. A disaster is an escalation of human need which overtaxes the response capability of the routine systems to deal with that emergency.

[Cont. on next page]

# CALENDAR

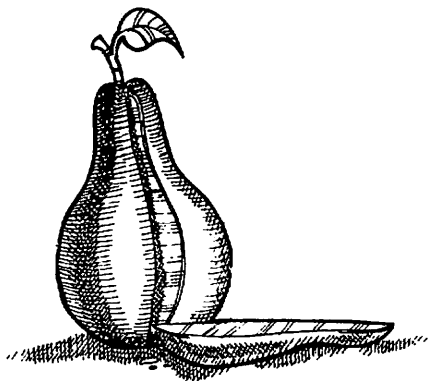
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Our present emergency systems do not provide for a smooth escalation to suit the escalating degree the emergency — from single rescue to multi-disaster.

In fact, we have illogically evolved entire separate systems to deal with different sizes of the same problem. Where is the line that differentiates between a multi-rescue and a mini-disaster?

And to which head of our Hydra-headed emergency response monster do we talk? To the search and rescue head, who operates routinely; to our medical emergency head, operating around the clock; to the law enforcement head, who operates 24 hours a day, everyday; or to our fourth head, who, in some areas, rises into action occasionally as the "disaster" head?

Interestingly enough, we are all the same emergency responders, talking to all those different heads.



In recent years, the population explosion, new technology, and a complex and interdependent society have made a profound impact on our existing social systems.

In order to impact death and disability, we need to re-think the present emergency response systems — or even the lack of same.

We need to:

- 1) identify the need, type and occurrence of the mission;
- 2) establish the operational communications that are the glue to hold the system together;
- 3) identify the resources and responders within the system and the level of activity and use of those responders; and
- 4) assign the responsibility.

Actually, there would be nothing very difficult about developing such a total Emergency Response System from within the existing apples, oranges, and bananas' expertise which operate routinely today.

It's merely a matter of blending the mayonnaise to bind the fruit salad together!

Total emergency response planning is good sense and good politics, and we need to get on with it.

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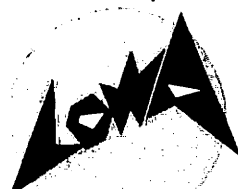
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# the METAL DETECTOR

## in avalanche search & rescue

JON GUNSON

---

The National Ski Patrol had been kind enough to invite our rescue group to attend their Avalanche Patch Course, which consists of an individual study course and one day of classroom instruction followed by a rigorous practical exam.

The day of the practical started out pleasant enough; a beautiful Colorado morning with some new powder snow and time for some skiing before the simulated avalanche rescue began. But then the alert went out, the exercise was underway, and before we knew it we were poking around in the snow, prying with a twelve foot length of steel conduit and trying to find the proverbial needle in the haystack. The avalanche deposition zone seemed enormous and the grins on the faces of the instructors told us they had the dummies well buried. We then proceeded to confirm their beliefs by taking over six hours to find the damn things. What if it had been for real? Frightening! The classwork had taught us that after one hour the victim has only a 50% chance of survival; obviously our "victim" would have had a tough time of it.

Later, down at the bar, wet, cold, exhausted and slightly plastered, we reviewed the day's efforts and agreed that there couldn't be a much more primitive method of finding a buried object than poking around with a stick. Of course there is much more to it than that; the ski patrol has done an excellent job of systemizing an avalanche rescue into a well run operation that can move quickly into the accident site and effectively utilize a large amount of manpower to give the victim his best chance for survival.

The "primitive" probe pole is an indispensable part of the system, and in its very simplicity lies much of its value: It's inexpensive, easily obtainable, has no moving parts, and anybody who can stand up can operate it. Best of all, it works! But after being on the end of one for six hours your mind is open to any suggestions. So there we were, staring at our beers, tossing out ideas on alternative methods of finding avalanche victims. I won't list some of the more colorful ideas (although creative), but after the laughter a few of the more plausible ideas remained: How about sonar or infrared or a

metal detector or a super-sensitive sniffer, or a listening device that could hear even a heartbeat under the snow. We spent the rest of the evening patting each other on the back for our "solutions" and wondering why no one had thought of these things before.

A few days later when I was going over the ideas with the U.S. Forest Service District Snow Ranger, he pulled out a copy of "modern Avalanche Rescue" by Ronald Perla and, sure enough, someone had thought of them before. Each of our ideas (the sane ones at least) was listed along with many others we hadn't thought of. Then after each method of detection there was an explanation of the problems of using it: Sonar was handicapped by the strong absorption of sound by snow and by the varying densities of avalanche debris. Infrared would not be detectable more than a few inches from a buried victim because the snow is such an efficient absorber of infrared radiation. A metal detector sensitive enough to pick up a zipper or a coat snap would be adversely affected by all the "background noise" from the large mineralization present in most mountain soil. Besides, a lot of the ski equipment is non-ferrous and therefore couldn't be detected. The "sniffer" idea is, of course, successfully used by the avalanche dog. The problem is having one trained and close enough at hand to get him into the accident site within an hour time frame. No mechanical device, however, can yet duplicate the nose of a good rescue dog. And, finally, the listening device has the limitations of poor energy coupling between the victim and the surrounding snow, as well as strong sound absorption of snow and interference from above-ground noise sources.

In a few short paragraphs our "brainstorms" had been neatly picked apart and dismissed as "needing further research." For the next two years we played it by the book except that every time I picked up a probe pole, I couldn't help thinking that there must be a better way. Then last September I was talking with a friend from out of town who is a treasure hunting hobbyist. I inquired about a catalog he had

*(Continued on page 20)*

## METAL DETECTOR (Continued)

from Garrett Electronics, and he enthusiastically told me that they were "the best in the business!" Before long I was on the phone to Garland, Texas, where Mr. Charles Garrett has his manufacturing plant and main office. After the standard series of explanations to secretaries, I was connected with Bob Podhrasky who is the Chief Engineer of Garrett's Detection Division. Mr. Podhrasky was very helpful and, being a skier himself, he had an immediate appreciation of the problems involved in avalanche rescue.



FIGURE 1

After some further correspondence, Bob matched up our needs with a brand new Garrett Detector that was just off the drawing boards and not even on the market yet. The Garrett "Master Hunter," very low frequency (VLF) type detector has the capability of seeking out large or small objects of either ferrous or non-ferrous metals in even the most highly mineralized ground. This, combined with ease of tuning and a new "stacked coil design" makes possible the detection of a dime at about 18 inches below the surface.

Our rescue group was sponsoring an avalanche seminar last March and Garrett Electronics loaned us one of the new models to demonstrate and evaluate. After the seminar we started testing the detector and were pleased with the results:

1. The unit is compact. It fits easily into a pack for transport into the avalanche site. (Figure 1.) When it is disassembled, the largest of the three pieces is about 26" long (figure 2), and can be made even shorter by folding the coil back against the support shaft.

2. Relatively light in weight. It weighs 5lbs. 2oz. complete with batteries. This is about the same as two twelve foot probe poles.

3. Easy (and fool proof) to assemble. The three pieces socket neatly and quickly together. They are held in place with spring-loaded pins (figure 3). There are no screws or nuts to handle with numb fingers.

(Continued on page 21)

## EXECUTIVE'S MESSAGE

JOHN OLSON  
First Vice-President

"The most successful search mission is the one that did not happen." Over and over we hear these words expressed by President LaValla and yet the SAR incident rate is increasing at an alarming rate. What is NASAR doing about it?

We have an Annual Conference to increase the knowledge of our members. Our Board meetings, ICSAR quarterly meetings, NASAR officer meetings, the volumes of prolific data sent out by our Executive Secretary, SAR magazines and the Gazette all carry the message of "we must do something about SAR." There is no easy answer to the question of what to do about SAR missions. Once the local sheriff is advised of a mission, many subjects should fear for their lives. Not only do they become the hunted, but the haunted also by well meaning rescuers. Once found the subject is still in great peril, for usually he is thrust into a litter and taken to the nearest hospital. For my money I'm glad this is the case. Even though many subjects do not need any actual help, there is no harm in using a little precaution, thus alluding any unforeseen circumstances. I don't mean to be caustic in my remarks, but once a search is launched and the subject is found, he or she, for the most part, is in the hands of very well trained rescuers. However - the subject must be found.

Back to the question of what to do: It is becoming more apparent that education is the answer. Programs in schools, for service clubs or for any community group all help. Articles in the papers and spot announcements on radio and T.V. are also solutions. Volumes of papers, books and articles all designed for the outdoorsman help. Who is responsible for writing these volumes, contacting the media and speaking at clubs and group meetings? We are, the members of NASAR! The State of Washington is way ahead in the education of people regarding Search and Rescue. It is not effective, however, for Skip Stoffel to submit information for a program that will take place in Podunc, Anywhere. The program will be more meaningful if Clem Cadiddlehopper, NASAR member and local resident of Podunc, makes the presentation with material supplied by Skip. Members of NASAR, the load is on our shoulders. We must carry our message far and wide. We are not going to stop people from doing silly things, but if our efforts cut down a few missions and save one life it will have been worth the time and energy expended.

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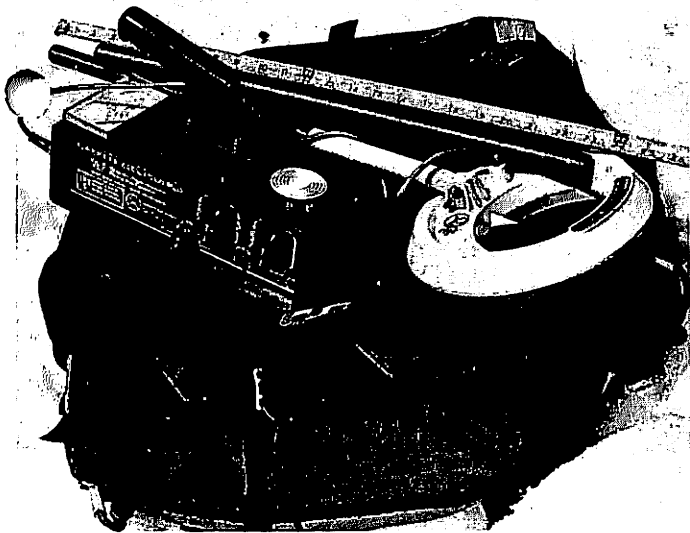


FIGURE 2

4. Easy to tune (figure 4). The volume is turned all the way up and then a balance is sought between the "tuning control" and the "ground zero control" until the barely audible tone remains constant when the coil is raised or lowered. The "ground zero control" allows the operator to zero out ground mineralization without affecting the sensitivity of the unit. Only metallic targets and mineral targets with a concentration different from the ground will cause a speaker or meter reaction.



FIGURE 3

5. Easy to operate. The coil is moved back and forth close to the surface as the operator walks along. (Figure 5.) This can be done fairly rapidly because the operator gets both an audible sound and a visual meter reaction to achieve maximum sensitivity response. This means he can watch where he is going and merely listen for a tone change, then zero with both the audible and the meter. The unit does take about 15 minutes of warm-up time and to avoid delay this should be accomplished during the trip into the avalanche site.

6. Inexpensive to operate — it uses six 9-volt

batteries which will last for over 60 hours and which works out to about 10 cents per hour of operation.

7. Durable — we gave the unit a workout with standard SAR abuse during the testing. The coil is very sturdy and completely waterproof; it can even be submerged. In addition, its sensitivity does not seem to be affected by the cold. The batteries, of course, are affected, but this might be easily solved by keeping the power source separate and well-insulated.

8. Sensitivity — we could typically detect part of a metal ski at 24" below the surface and the metal tip of a bamboo ski pole at about 18" down. Smaller items such as a boot buckle or a jacket snap can be detected 12" to 18" beneath the surface (figures 6 7).

9. Cost — the cost (about \$325) is reasonable when compared to other electronic gear used in SAR, such as radios, skadis, and E.L.T. direction finding equipment.



FIGURE 4

(continued on page 26)

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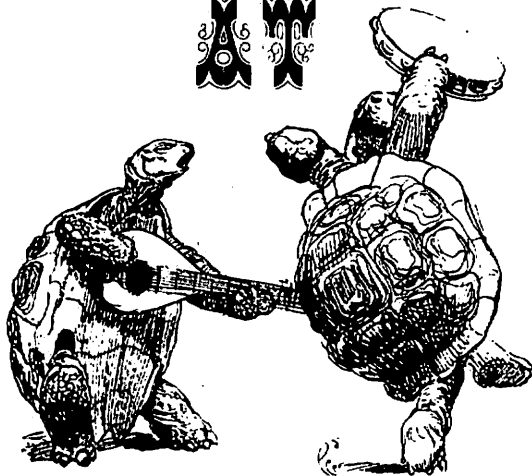
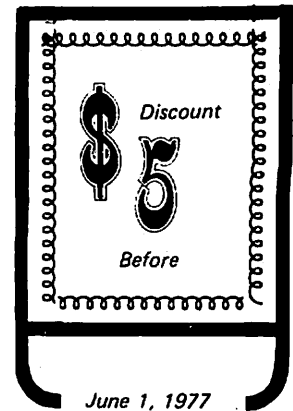
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# SEPTEMBER 15, 16, 17, 18 - 1977

RODEWAY INN AIRPORT - NASHVILLE, TENNESSEE

# RIP-OFF At Coahuila

GROVER BRINKMAN

It takes but a few minutes of time, Max Coates realized, to trigger a bomb or hang a yoke around a lawman's neck.

Looking at his problem objectively, it was all caused by Lonny Giles, so inebriated that he had to bed him down in his shack at Sawmill Gulch. That little chore took forty minutes.

And while he was out of town, an act of violence had been committed on Coahuila's courthouse square, moments after the Bayou National had unlocked its doors.

The protagonist who created the violence was a lone white male, perhaps 23, who at gunpoint had relieved cashier Mattie Snead of a sizeable sum of money.

That, however, was only part of the action that the sheriff had missed. The holdup man took with him Lisa Etienne, presumably a hostage.

When Max got back to town, a group of eager beavers all tried to tell him about it at the same time.

"He grabbed Lisa as a hostage, headed for the swamp," poolhall operator Larry Berger said tightly.

"This ain't goin' to help your reputation any, Sheriff!"

"Whar in tarnation you bin, Max?"

"I've always said, when you need an officer, one's never around!" This sage observation came from Cloe Block, who had a boutique adjacent to the bank.

Max waved them to silence, with a tight smile, and an attempt at patience.

"All right, Larry!" He let his eyes rove the crowd, then centered his gaze back on the poolhall operator. "How do you know the holdup man is heading for the swamp?"

"Two highway patrolmen were coming in from Gateway when they picked up the call. They threw up a road block. There's only one way out of Coahuila, you know that. So what could the fellow do but swing south on the blacktop that ends at Fisherman's Cove, with the swamp on three sides."

Max kept his eyes on Berger. "Okay, I'll buy that. Now about Lisa. . ."

"She merely walked out of the cafe at the wrong time. This fellow grabbed her, slammed her into his car."

Cloe, the boutique operator, protested. "You certain he grabbed her, Larry?"

"Of course!"

"It could be that Lisa went along for the kicks."

Max pivoted to face the crowd, cold rage building

in his lean face. "Let's not put Lisa on trial!" he said curtly. "What I want to know is: who's telling it as it happened."

"I'll swear by what I said," Berger continued, friendlier than the others. "This fellow scooped her up like a sack of potatoes, pushed her into the car. she fought him. Believe me, she fought him. At last he belted her one — hard."

"Okay, Larry," Max said soberly, turned away from the din of a dozen voices.

He closed his eyes for a moment, and it all came back so vividly, the last date he had had with Lisa, that moment of truth he would never forget.

"You dead-set on being sheriff, honey?"

"Right."

"It's a thankless job."

"Maybe."

She tugged loose from his arms, eyes on his own, evidently trying to find an answer to something that troubled her.

"You won't be sheriff very long if you marry me."

"What made you say that?"

A flintiness crept into her gray-green eyes. "Folks cotton to me in Coahuila."

He mashed his lips over hers, stifled her further protests. And soon he felt the warmth of her, the fury inside her. All of this emotion and love was for him, he believed. But still she hesitated, and he the reason: her dissolute father.

"He pulled her even tighter now. "Honey, you listen to me! I love you! I don't love your old man, I don't love the blowhards who peddle gossip in this swamp town. I love just you. It'll never die. So don't hold back any longer. . ."

Her eyes searched his with a wistfulness that tightened his lips. He had a feeling that she would burst into tears. But she did not. Instead, she flung herself into his arms.

"Okay, honey, but I'm still running scared. . ."

A car drove up now. A lean, lithe man slid out — Tom Swearington, his only deputy. Max stepped away from the crowd, motioned.

"I heard about it, coming up from Lutesburg," Tom said. "Did you miss it, also?"

"Got the perfect alibi, bedding down old Lonny."

"Well, that puts both of us in the dog house."

"With the door nailed shut. I'm going to talk to Bordeaux. You get my gear ready."

"Am I going in with you?"

(Continued on page 24)

RIP-OFF (Continued)

"I wish you were, but you've got plenty to do right here."

He entered the bank. Mattie Snead, the aging cashier, sat in a chair, fanning herself with a newspaper. Henri Bordeaux, the granite-faced president, greeted him curtly. This was understandable, Max conceded. He was the brand-new sheriff, succeeding veteran Jim Lesly, the party man. Now the bank had been robbed. As luck would have it, he had been at Sawmill Gulch, bedding down a town drunk. His deputy had missed it also. A girl had been used as hostage. It all added up to a certain hostility.

Bordeaux faced him. "Think you can get our money back, Max?"

"I'm going into the swamp and find this fellow, and the girl."

"I'm not worried about the girl," Bordeaux said bluntly.

Max's lips tightened. "Well, I am!"

"I'm thinking like most folk," Bordeaux said further. "She went along willfully."

"Why all of this dislike for Lisa?" Max asked, trying to keep his voice civil. "Can she help it if her old man's a sot? In my book, she's a fine, decent girl!"

The banker never answered, turned away. Then he pivoted. "I'd suggest you call in some help."

"I intend to do that!" Max said tersely. "If it eases your mind any, I'm going to ask your old friend, Lesly."

Bordeaux looked surprised. "Lesly?"  
"He knows the swamp. I'll bury my pride, ask him to come along."

As he piloted the sheriff's car down the street on which the ex-lawman lived, Max wondered what would be Lesly's reaction to his plea for assistance. Evidently Lesly had been an active sheriff, but there was about the man something that put Max on the defensive each time their paths crossed. This feeling was inherent, a character analysis he could not explain.

Lesly's home address was 462 Sycamore. Max drummed his knuckles on the front door of the white frame cottage, listening for sounds of footsteps approaching. He knocked the second time, waited. Instinctively he glanced at the house number, positive that he was at the right address.

And then something clicked in his mind.

When Tom Swearington had talked to him, following the bank robbery, he had stated that he had gone to Sycamore street on a disturbance check. The number had been 462. This same cottage?

Or could Tom have been mistaken in the address?

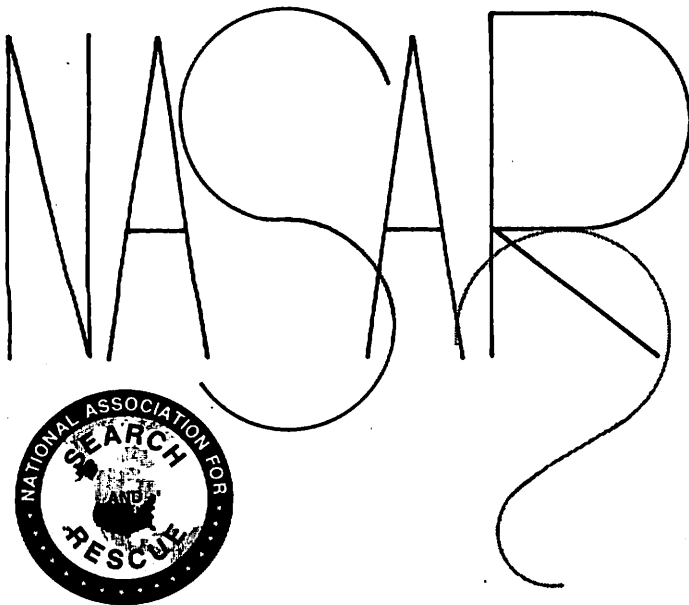
Back at the office, discarding his shoes for waders, Max brought up the subject. "That call you answered, Tom. You certain it was 462 Sycamore?" Swearington checked his notebook. "Right."

"Jim Lesly's home?"

"Yes. That woman he married about three years ago met me at the door, said Lesly was in Lutesburg,

(Continued next page)

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### RIP-OFF (Continued)

in some kind of fracas. Would I drive down there and neck?"

"And what did you find at Lutesburg?"

"Eight miles of driving for nothing. No Lesly, no trouble.

That was food for thought. But Max decided that he would have ample time to digest that once he gained the swamp.

"I'll follow the bayou south until dark," Max informed. "Stay here and don't let any busybody come out to help. I'll meet you at the fisherman's camp at dusk. Better bring some sandwiches and coffee."

A needle in a haystack, or to be more exact, two needles in a haystack! That was the enormity of his task, Max realized as he left his car at the cove, started toward the quagmire. A huge wasteland, the swamp spread for twenty-odd miles to the north, the same distance southwesterly. On the far side of this L-shaped wetland was the state boundary line. "If that stickup fellow thinks he can walk to freedom through the sinks, he's loco!" Max said to the emptiness.

He found the escape car at the end of the rip-rap road that loggers had used in snaking out cypress. It was a beatup sedan possibly three years old. Now it sat like a wounded duck, buried axle deep in the gumbo.

There was a bloody handkerchief on the floorboards, something that puzzled him. To his knowledge, there had been no shot fired in the holdup. On the steering wheel rim his fingers encountered a gummy blood smear as well.

There were no footprints about the car, but this

was understandable. The gumbo was ankle deep here; tracks closed within moments after imprint.

He found himself thinking of Lisa again. How would she react? And what of the man: would he think first of escape, or would he have time to molest the girl?

This swamp was a cesspool of nature, brackish bayous, the decay of vegetation long dead; hot, humid, dehydrating to the human pushing deeper into the brakes. Sabergrass and prickly pear tore at anyone forcing entry.

After dark, flickering foxfire was an elusive ghost, to confuse and frighten. Slimy things inhabited it as well, moccasins in the sinks, rattlers in the thickets. How would this react on a girl like Lisa? Or the man?

If he was a greenhorn, unfamiliar with the local terrain, the swamp would cut him down to size in a hurry. But with Lisa it might be different. At least she was a native. Max knew her as a hardy, athletic type of girl. She had always fished and hunted with her father on those occasions when he was off the bottle. The swamp was no stranger.

"She just might have a chance," Max said tightly.

Coahuila had never been kind to Lisa because of her father. Max intended to tear down this wall, even if it took years. He knew her for what she was.

There were no tracks. As he wormed ever deeper into the brakes, this fact grew more perturbing at each step. Instinctively, any human would keep to the higher ground as a matter of safety. Somewhere he would find the imprint of a shoe still recognizable in the gumbo.

Giving the man a gambling chance, he would slip somewhere. There would be a broken palmetto frond, a bent-over twig, trampled moss, a footprint on de-

(Continued on page 28)



FIGURE 5

Okay, so what does all this mean when it comes to an actual avalanche rescue situation? Put very simply, we don't know. According to the latest revised statistics gathered by Dale Gallagher and Knox Williams in the "Snowy Torrents," the avalanche victim has only a 50% chance of survival after only 30 minutes of burial (as opposed to one hour previously supposed). Obviously, time is of the essence in avalanche rescue; however, it is almost impossible to estimate exactly how much time (and, consequently, lives) can be saved through the use of a metal detector. There are just too many variables such as size of deposition zone, depth of burial, position of burial, number of probes and detectors, etc. Also in "The Snowy Torrents" we find that only about 30% of the avalanche victims are within 24" of the surface. Therefore, the device we tested would only have a chance of direct detection in about a third of the cases, but even that would be a tremendous improvement over using probes alone. The effective depth of detection may soon be increased, however. We were using an 8" diameter coaxial coil for our experiments, but Garrett Electronics tells us that they have recently developed a 13" x 24" search coil which allows much greater depth coverage. Since over 50% of the victims are statistically within 36" of the surface we only have to extend a little further to get the odds shifted in our favor.

In any case, we feel the detector would prove very effective for the "hasty search" phase in which likely burial zones are checked very rapidly before resorting to probe lines. Even if the victim is not found directly, the detector may find valuable clues such as a ski pole or ski or a glove with a metal snap clip. By lining up the positions of the clues, a probable line of descent of the victim could then be established. This line could then be more carefully searched with the detector(s) or, failing this, it would give a more concentrated area to probe, thus saving valuable time. In addition, the device seems especially well suited for wilderness avalanche SAR (as opposed to that within ski areas) because of the



FIGURE 6



FIGURE 7

much longer time lag normally involved as well as the lack of probes on the scene. It would seem that the detector could add to the effectiveness of even a small team by giving some indication of where to probe and dig to best utilize their limited manpower.

In closing let me stress one point: we're not suggesting in any way that one person with a metal detector can replace the excellent methods that have been developed for avalanche SAR. On the contrary, it is simply one more tool. It obviously needs further testing but it should be a welcome addition to the search and rescue effort.

# NEWS & rumors

William G. Syrotuck — 1930-1976. Bill Syrotuck passed away on October 21st while undergoing open-heart surgery. Bill had long been identified with search and rescue, primarily in the use of German Shepherd search dogs. At the time of his death he was President of the International Search and Rescue Dog Association. He was the founder and an action Operation Leader of the German Shepherd Search and Rescue Dog Association of Seattle. Bill had written several pamphlets on dog search technique and was active in statistical research on search patterns. He was an innovative leader in the development of search strategy and tactics, and much of his philosophy is reflected in the programs of SAR management schools throughout the nation. He had been a consultant on search for the National Park Service for several years, and was a regular member of the faculty at their annual SAR training courses, specializing in the use of dogs in avalanche search. Bill had also traveled to Austria and Scotland to help strengthen dog search programs. Over the year Mountain Rescue Council worked with Bill on a number of searches, most recently near Lake Wenatchee, Idaho in October, 1973, on the 6-day search for 3-year-old Jimmy Duffy. Bill made a very substantial contribution to the field of search and rescue. ▲



**AWARDS** — In October 1974 Mr. Jack Bottoms, Manager of the San Francisco Field Service Station of the National Environmental Satellite Service (left) and Lt. Col. James Bigelow, Director of Operations for the California Wing CAP (right) initiated a program to utilize satellite photos for search and rescue (SAR). The program started with missing aircraft searches within California and was later expanded on a national basis by the United States Air Force Aerospace Rescue and Recovery Service located at Scott A.F.B., Illinois. The development of this technique has contributed greatly to a 25% reduction in SAR flying hours flown by the military and CAP aircraft within the continental United States. Mr. Bottoms received recognition for his efforts at the annual meeting of the National Association for Search and Rescue (NASAR) while Lt. Col. Bigelow was awarded "Senior Member of the Year for 1976" at the CAP National Board meeting in Philadelphia.

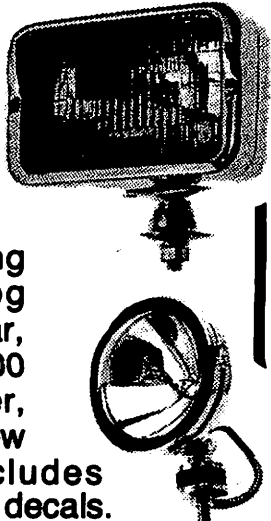
**Personnel of CAP Squadron 111, California Wing** were assisted by the San Francisco Field Service Station of the National Environmental Satellite Service (NESS) in Redwood City, California in the development of utilizing satellite photos for search and rescue (SAR) planning. At the start of the program, satellite evaluations were conducted for missions within California and later expanded to include the continental United States. The use of this data proved to be a significant aid to SAR activities. Satellite data is now available on a routine basis for missing aircraft search operations coordinated by the USAF Aerospace Rescue and Recovery Service Coordination Center (AFRCC) located at Scott A.F.B., Illinois.

Satellite data is provided to the AFRCC by the USAF Global Weather Center for the eastern United States and the San Francisco NESS station for the western United States. The AFRCC has designated CAP squadron 110 of the California Wing to review the satellite data to assist the AFRCC for the western United States. Copies of the satellite photos are then forwarded to the AFRCC. Pictured here are (left to right) Mr. Bill Denney, National Weather Service WSFO, Capt. Jim Howell, CAP Squadron 110, Capt. Mark Polansky, CAP Squadron 110, Mr. Tony Gerst, San Francisco NESS Station.



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bris that would reveal human passage. If she had any hope of rescue, Lisa would try to mark the trail. But there was nothing.

His face grim, Max circled back to the abandoned car at last, started anew in a widening circle, a slow, methodical search. Somewhere he would find this footprint he was searching for.

He found his thoughts back on the bloody handkerchief, the gummy smear on the steering wheel. What did it mean, the man's blood — or Lisa's?

The sun was nearing the horizon now. Still he had not found a single trace of the two. It was uncanny.

If he was tracking some native, an old swamper like Tom Swearington's father, or Lonny Giles, it might be acceptable. But he was quite certain that the young bank bandit wasn't a swamper.

Then another, more startling thought chained his mind.

Both of them, even now, might be dead!

Looking at it objectively, the thought grew in plausibility. There were sinks where the unwary would disappear from view in moments. The bandit, rushing blindly ahead, might have blundered into one of these pockets, carried Lisa down with him.

Night came at last, with flickering foxfire playing an erratic ghost. He headed back to Fisherman's Cove.

Tom was waiting with food and coffee, two things he sorely needed.

"Not a single track!" Max lamented. "I can't figure it!"

The lean man rolled a cigarette. "Remember the two Hawkins boys, Max? And that cocky fisherman from Houston?"

Max nodded. "If the man was alone I'd accept it, Tom. Total disappearance in the muck. But Lisa is no fool. She's been in the swamp ever since her pig-tail days. I would suppose that she could take care of herself."

Tom shrugged. "Well, at least the highway patrol are still on the job."

Max drained his coffee cup. "Give me your personal opinion. You know this hellhole as well as I do."

"It's possible the man is much smarter than we think," Tom said slowly, "or the sinks have claimed them."

"There was anguish in the sheriff's face as he picked up his rifle, faced his deputy. "I'm going back in," he informed. "I'll follow the South Reach as far as the gumbo will hold me. If they're still alive I'll see their campfire. They can't go through the night without a fire."

"What about snakebite?"

"I'll take that chance."

"One other thing," Tom said, "Lesley's wife called the office to thank us for the Lutesville run. said it had been a personal thing that's all cleared up."

"Well, at least that's something," Max said. "I'll expect you here at dawn."

He waited for the moon before starting back in. Then he inched his way along, following the gumbo

hogback called the South Reach. He was overly cautious now, watching the driftwood.

The swamp suddenly awoke to the nocturnal voices of its denizens, the croak of frogs, the hum of insects, the beat of wings, the yip of foxes on the prowl.

Max listened for a sound apart from this cacophony, a human word, an explosive cough, the flushing of some bird. His nostrils were attuned to a whiff of cigarette smoke, the odor of a woods fire. But nothing teased his senses or quickened his eardrums.

At last, in desperation, he climbed one of the tallest pines he could find, working his way to the spiny top. Then he hung like a swamp squirrel, checking the terrain below. But there was no pinpoint of light from a guarded fire, or a bit of wispy smoke haze. Nothing but the morass itself. He climbed down at last, exhausted, hunkered down at the tree's base, buried his face in his arms to shield himself from the mosquitos, closed his eyes.

Something was wrong, so subtle that he couldn't put his finger on it.

Dawn came as a delicate quickening, first a stirring of winged creatures, the cry of a loon, the flight of owls. The sun burned back the mists above the pools, added a pastel, shafted glory to the age-old trees and the Spanish moss that hung like old men's whiskers from their branches.

Max was rubbing the stiffness out of his limbs, when he heard the sound. It came from the far side of the sink.

Then he saw the man, his clothing torn and ragged. He was hunkered down, his back towards him. The foliage about him looked like a cluster of May apples. Perhaps he was searching for food.

Max cradled his rifle, smiled grimly, slowly waded out into the sink.

He misjudged this one. Soon he was in so deep that he had to hold the rifle above his head, the water up to his armpits. He waded slowly, noiselessly. His eyes never leaving the man, he failed to see the cottonmouth in his path.

When he did see it, he was much too close for comfort. Max jerked up, watching both the snake and his human quarry. He well knew he was in a very awkward position. The moccasin was almost at eye-level, within striking distance.

There was but one thing to do, back off. Max took a single step backward, froze. A voice stabbed from the rear.

"Don't move, sheriff! Or if you do, straight ahead!"

He failed to identify the voice. It had a familiarity, but was so guttural its maker evidently talked through a handkerchief.

"You're crazy!" he said at last, watching the snake. There happens to be a big cottonmouth in my path."

"I know that!" the voice intoned. "What will it be, the moccasin, or a slug in the back of the skull?"

Max felt his neck muscles tighten. He had blundered into some apparent setup. Suddenly he was cold to the bone.

(Continued on page 29)

RIP-OFF (Continued)

He was trying to identify the voice. In his fear, he was laboring to make the right decision. Which would give him the greatest odds: to push ahead and slash out at the moccasin with his upraised rifle, or wheel and shoot at the voice so close behind him?

Standing deep in the muck, he could hear the steps edging closer, the gentle movement of water.

"Hurry up!" the voice commanded. "Make your decision!"

Max realized his feet were deep in the gumbo. Even to turn a bit would take seconds. He decided that he would have better odds with the snake.

"Five seconds!" the voice urged.

Max pulled his feet from the muck, slowly, one at a time. Then he threw himself forward, bringing down his upraised rifle.

But the action of the moccasin was whiplashed lightning.

Even as he moved, Max saw it lash out at him. He moved his torso to the left, but not fast enough. The fangs caught him high in the right shoulder, a sting of fire. Then it was gone.

The steps came up doubly fast now. A heavy object crashed down. Max felt the canopy of the buckbrush in his face as he fell. He heard footsteps retreating, someone shouting. But already he was so deep in coma that his world blackened into nothingness.

When he returned to consciousness, the first thing that Max heard was a voice, sobbing. He opened his

eyes but nothing was in focus. He blinked, trying to coordinate his mind. Finally the blur above him dissolved into a girl's pallid face, Lisa. He tried to move but was too weak.

She raised a finger of caution, motioned for silence. Then she bent low over him, whispered: "Don't make a sound. They're beating the bush for me. . ."

He was flexing his fingers, trying to touch her.

"The snake got me, didn't it?"

"You also got slammed on the head with a gun butt. They had me tied up, but I got loose this morning while they went after you. Most of the day you've been very ill. . ."

He got one hand to his shoulder now, felt the bare skin where she had ripped away his shirt.

"You - saved - my life, honey!" His words were still guttural.

A tight smile softened her face; she bent low, kissed him. "Maybe you can save mine, now."

Time dragged by. He fought for a strength that was slow in returning, tried to sit up. He didn't make it the first time. A half hour later he did, with the girl's arm about his shoulder.

He saw that she had dragged him deep into a dense thicket of palmetto, head-high, so dense it was a jungle.

Something didn't jell. "You were saying: 'they tied me up.' Who's the second man with the bandit?"

"His step-father, Jim Lesly."

It jolted him. Then the obvious asserted itself in

(Continued on page 30)



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SR 37

his groping mind; he saw the answer to questions that had vexed him each moment of the search. For one thing, it explained the difficult trail.

"You were tied up?"

She talked fast, in a tight, nervous whisper, her face close to his own. This man is a son of Lesly's second wife. The way I see it, the bank robbery was a setup between Lesly and his stepson. The latter would pull the caper, hole up in the swamp. Lesly, who is an old swamper, would conceal him until the heat was off. Then the stepson could vanish across the state line. In the meantime Lesly would come back from a hunting trip, perhaps splitting the loot."

Max smiled, still amazed at the incredulity of it all but fact accepting its logic. For in these words, Lisa had explained much of the unexplainable, the fake calls to get both Tom and himself out of town at the strategic moment.

"But where do you fit in?" he questioned.

"I don't! Evidently the bandit lost his nerve at the last moment. I was coming out of the cafe, and he grabbed me as a hostage. Lesly hit the ceiling when we met in the swamp, and he saw me. They were arguing about me all of the time. Lesly wanted to push me into a sink; the stepson evidently had other plans. . ."

Max felt cold anger ripple his insides. He sat there, held her hand, praying for physical strength.

"Last night you made a mistake when you climbed the tree," she said softly. "Lesly spotted you."

"But the snake? Why didn't Lesly shoot me, get it over with?"

"I heard them arguing about using a gun on you. Lesly was against firing a weapon, afraid it would pinpoint their position to anyone hunting for them. Then he saw you asleep, against the tree, and the big moccasin on the debris. He set up the decoy. . ."

All Max could do was pull her into his arms, kiss her. His mind was back to its usual alertness at last. But with it came a new fear.

"They'll never give up until they find you. They presume the snake and the sink finished me for good, but you. . ."

"I know," she agreed. That's why I carefully brushed out all signs leading to this thicket. . ."

"If only I had a gun!"

Her smile was tight. "We have. I found your rifle in the muck. I've spent most of the day, cleaning it."

Shadows were lengthening. When the moccasin had struck, it had been early morning. Now it was dusk.

At last they evolved the only feasible plan they could think of.

The hours passed on leaden wings as the girl sat by the fire. It was a tiny woodsman's fire, literally a candle in the gloom. She sat facing it, her back against a scrub pine. Evidently she slept the sleep of exhaustion.

Inside a carefully constructed windfall back of the girl, Max kept reassuring himself that they wouldn't shoot on sight. They would be afraid to, knowing they were still being hunted. A gunshot would reveal their whereabouts. They would try to subdue the girl in some other way.

Or were they desperate enough now to shoot first? Time, inexorable, ticked on. Inside his shelter, Max could almost touch her hair. He knew the terrific strain of the moment, sitting there, the bait, her clothing torn, hair disheveled. But it was the only way.

Watching her, fear came up inside him like a constricting rope.

An opossum sniffed at the odor of smoke, retreated. And still nothing broke the routine of the night, so peaceful and yet so deadly.

If Lisa wasn't asleep, her pose was the perfect picture of exhaustion. Max waited, his finger tense and sweaty on the trigger of the cocked rifle. He was still weak; he craved water, he needed food as well. But first things first.

He caught himself drowsing. Suddenly he was frightened of his own inability to remain awake much longer, playing this cat and mouse game.

They weren't going to take the bait!

Lesly was too wise to be tricked.

Then in almost the same instant, Max realized that he was wrong in his conclusions and suddenly he had a new respect for this man, Lesly, his uncanny ability in the swamp.

Lesly stood there, not ten feet distant, facing the girl!

There had been no sound. Max waited, his body tight as a coiled spring. He saw the stepson at that moment as he moved in, to the left of Lesly. They crouched, ready for the spring.

Max shouted like some banshee.

Suddenly his rifle was streaking flame.

He was thinking of the snake bite, the innocent girl. His first shot took Lesly in the right shoulder, spun his body. His second slammed into the leg of the stepson. They both were down.

He was upon them like a cat. When the younger man tried to bring up his gun, he kicked it out of his hand.

Max handed the rifle to Lisa now. Using the single pair of cuffs he carried, he yoked them together.

"I promised Bordeaux I would bring back his money!" Max said, gasping for breath. "Where is it, Lesly?"

The retired lawman merely glared at him, sick with pain.

The stepson moaned. Max took the rifle from Lisa, smiled wanly.

"Don't worry!" Lisa informed. "I know where they buried it."

"Fine!" Max said, trying to conceal his weakness.

He stepped back, fired three shots into the air, a signal to his deputy.

Lisa bent to throw more wood on the fire, and as it flamed up, he saw the scratches, half-hidden by the dirt on the face of the stepson.

"There was a bloody handkerchief on the floorboards of the car," Max said. "It had me puzzled, but now I know."

Even a woman's fingernails are useful at times," Lisa said grimly.

A pointed nose edged into the circle of firelight, sniffed at the men on the gumbo. Then the opossum quickly retreated.

# 'EMT plan' for mountain SEARCH & RESCUE teams



The concept of a mountain rescue team presupposes the capability to deal with any SAR situation that might arise in a mountain environment. At such time that more specialized equipment, expertise or additional manpower is needed the group can coordinate through a neighboring rescue team or, the case in Colorado, the Colorado Search and Rescue Board, Inc. Obviously a rescue team may encounter situations whereby outside help may be required. When injuries or illness are encountered the initial "bash team" must be able to stabilize the patient and manage life threatening problems when and if they arise. Because of inaccessibility, due to terrain or weather, outside help may be hours away. Survival for the victim, in the event of injuries or illness may rest entirely on the performance of this initial team. The following discussion then will deal with a continuing Emergency Medical Technician (EMT) training and operations plan for mountain rescue teams. This is one program that has been initiated with the Vail Mountain Rescue Team. Variations may be instituted according to current levels of training, equipment and most likely operations environment. The following aspects will be discussed: 1) physician advisor, 2) training manuals, 3) communications, 4) training routines and schedules, and 5) methods of acquiring and evaluating new field techniques.

The first requirement for a medical capability will be the basic Emergency Medical Technician who has fulfilled the requirements of the Department of Transportation 81 hour EMT program. This program is generally available locally through a hospital, university or community college. In areas where it is not available, the state department of health should be contacted and notified of the interest in your area. Presently, the Colorado Department of Health requires renewal of this certificate every three years through an approved 32 hour refresher course. This is minimum and it is hoped that the EMT who is not working as a full time EMT will seek ways to remain involved on a regular basis. As Stan Bush suggested in his presentation at the HEW National EMS

Rural/Wilderness Symposium in Denver on February 2, 1976, it is much easier to train qualified mountaineers to be EMT's than to train EMT's to be mountaineers. This being the premise it would then be in the best interest of each SAR team to ensure at least one qualified EMT on each "bash team."

*(Continued on page 32)*



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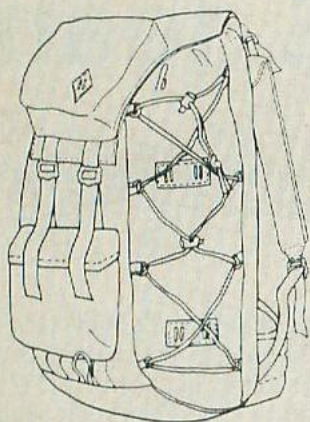
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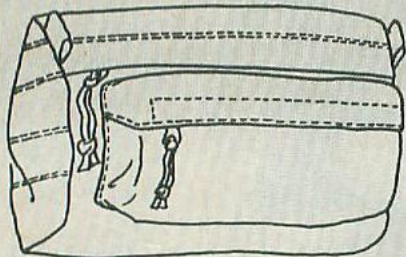
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**EMT PLAN (Continued)**

**team training**

Once a qualified core of EMT's becomes a part of the SAR team, a method of team training must be instituted. This is necessary to insure competence with available team equipment, a teamwork attitude that will survive under stress, and of course a means of disseminating relevant mountaineering medicine information. To supervise and interpret medical information and to formulate standard operating policies, a medical advisor must be acquired. This would be an M.D. who desires volunteering his time, and preferably one who is interested and active in outdoor/mountaineering related activities. With due respect to a physician's training, the realm of mountaineering medicine, field survival situations, survival physiology and life support without even basic ambulance equipment may tax even the most astute mountaineering physician's medical repertoire. Perhaps at this point we see that a basic EMT must be trained and oriented in ways of basic life support that are performed under completely or partially different circumstances than indicated in the basic EMT training. The basics are essential and thus the reason for requiring the DOT 81 hour program. However, more specialized training is needed to adequately handle outdoor emergencies beyond the roadhead. If this is the case, what training manual or reference should be used as text and to be expounded upon by the physician advisor?

**a few good publications**

There are few publications that deal specifically with first aid or life support in a mountaineering situation. One that does, and with sufficient detail, is *Medicine for Mountaineering*, published by The Mountaineers (2nd edition) and edited by James A. Wilkerson, M.D. This text is presently required of all EMT's on the Vail team and reading assignments are made each meeting by the physician advisor. Following the meeting a discussion of the assignment is held, with an emphasis on establishing a team policy concerning certain procedures such as splinting with certain type splints, I.V. needle length and gauges, head injury assessment, treatment of hypothermia in the field, etc. This "standardization," even though many exceptions may be allowed, enables better understanding during radio communication to the team physician. The physician understands that the EMT will perform in a certain manner and with certain equipment. The EMT will likewise be aware that the physician knows his capabilities and the equipment he has to work with.

*(Continued on page 34)*

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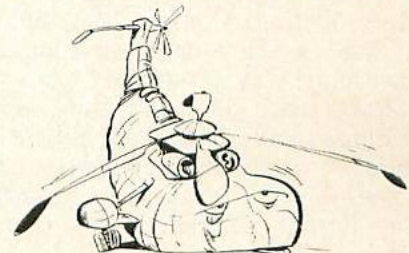
## San Mateo, California County Council Explorer Search and Rescue "INFORMANT"

A distraught San Mateo, California family, convinced that the visions of an East Bay clairvoyant described the location of their son's body, took up the search on their own after two searches mounted by the Sheriff's Office had failed. The unfortunate parents made a grisly find; the body of their son was found some ten feet from a roadway which the clairvoyant had described.

The 26-year-old man had last been seen by his brother, who dropped him off at a country store in the rugged Emerald Lake area west of Redwood City, California. The concerned parents recalled reading of the powers of this woman clairvoyant in an article which had appeared in the *National Enquirer* last year. The parents contacted the woman on August 8th or 9th. Based upon the information which the woman furnished, the Office of the Sheriff conducted a search with dogs on August 10th. On the following day the Sheriff called in SMESAR as well as Post 812 and Post 810. Each unit searched a separate and distinct area which were somewhat removed from the location of the actual find. Presuming foul play, the Sheriff's Inspectors had assumed that the body would have been thrown downward, into the canyon, from the roadway the woman had envisioned. In this instance, the body had actually been dragged above the road, but not very far, admittedly.

The ESAR personnel who responded to the search conducted by the Sheriff are the following: Field Leader, Rick Erker (in charge), Mark Ghilarducci, Greg Kaufman, Karen Cook, Dan Galbraith, Steve Snider, Dave Brown, John Keating and Dan Ducasse.

The account in the local newspaper regarding the clairvoyant is interesting. According to the article, the woman began to have visions in 1960 when she underwent surgery. Because of an allergic reaction to the anesthetic, her heart stopped; after she was revived this power mysteriously appeared. The woman, allegedly, has located 19 children thus far this year. The newspaper account also states that the woman had visualized the body of Lois McNamara near Tunitas Creek. This claim is of particular interest to SMESAR, since it was our members who discovered Mrs. McNamara's remains. At the time, they had no knowledge of a clairvoyant involved in the case. They believed that they were searching Tunitas Creek Canyon because another victim of the murdered paid, had also been dumped in the canyon and had been discovered previously. Did the clairvoyant's vision merely coincide with their discovery or did her information lead the Sheriff to search Tunitas Creek Canyon? Dare we ask the Office of the Sheriff?



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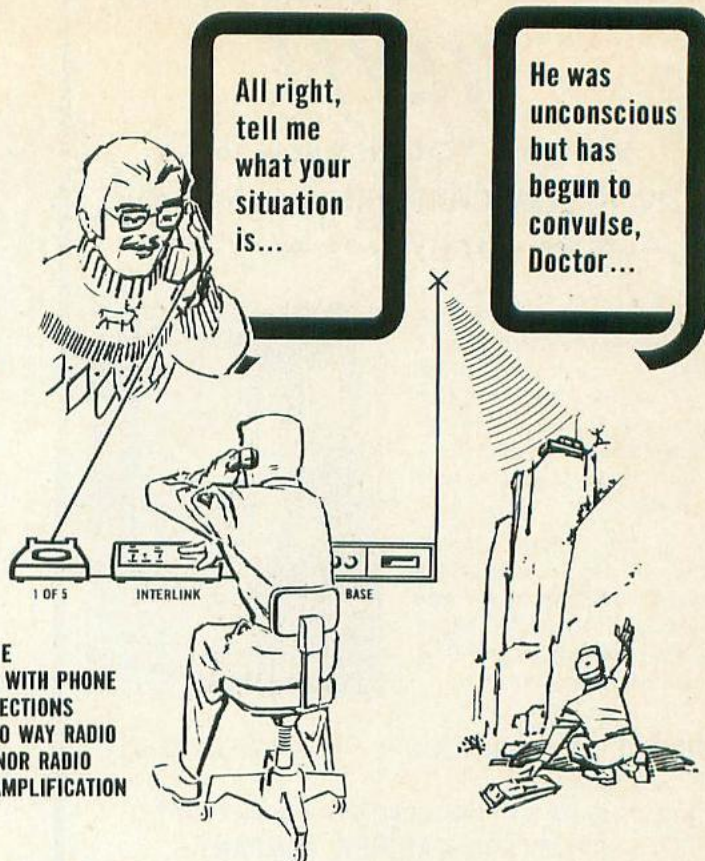
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### EMT PLAN (Continued)

This is accomplished by having the team "med-packs" available at training meetings for physician and EMT familiarity training. Utilizing a common text for teaching also contributes to a "baseline" for discussion and continuity even though the physician may occasionally deviate or disagree. Another text which is concise and emphasizes field expedients is *Mountaineering First Aid*, by Dick Mitchell and published by The Mountaineers. An expanded bibliography has been compiled from various sources and is used as additional reference material.

Most rescue groups will utilize some form of radio communications during all or part of a rescue effort. Operational policies must be formulated for the inevitable period when radio communications are not available or will not operate due to atmospheric or malfunctions. The Vail Mountain Rescue Group currently uses three Motorola model MH 70 5-watt portable units with three channels – the MRA frequency 155.160, State Patrol channel three 154.905, and Vail Valley Medical Center EMS 155.340. The hospital antenna is sited on Vail Mountain which enables communications directly to the physician advisor from most of the team's operating area. Hospital nurses have been made aware of the rescue team medical system and will contact the physician advisor when medical data is to be transmitted from the field. Future communication plans call for a

25-75 watt mobile base unit. This could be used as a relay to the hospital, less desirable because of third party involvement, or as a field base unit where the physician can be transported by local law enforcement vehicles and speak directly to the team. State Patrol channel three may also be used to local law enforcement vehicles when MRA or EMS channels are inoperable.

### team meetings

Training meetings, of which at least 50% should be attended by the physician, may be scheduled according to group agreement but twice a month should maintain a relatively high degree of proficiency. Practical training, as opposed to lecture, should be regular and include application of all "med-pack" equipment such as traction splints, air splints, backboards, suction, BP cuff, I.V.'s, etc. It cannot be emphasized enough that actual practice and application of the equipment, patient assessment, and communication techniques will make patient care the best possible.

Any endeavor that requires a degree of resourcefulness and improvisation requires also a method of acquiring and evaluating new ideas. A team member or committee of members (EMT's) should correspond with other teams and mountaineering medicine resources (Yosemite Institute) mountaineering clubs, expedition members, climbing physicians, high alti-

(Continued on page 35)

## EMT PLAN (Continued)

tude physiologists, etc.) in order to keep abreast of new ideas and methods. Evaluation of new methods and procedures can involve the entire rescue team during practice sessions in order that all team members are aware of new medical techniques and equipment. The point is also made that any team effort, whether it be medical or otherwise, cannot be successful without the abilities and concern of every team member.

The following publications are by no means exhaustive but provide some of the latest ideas of mountaineering medical personnel and research scientists. Human physiology and emotional response in the outdoors is important to all of us as we seek to narrow the possibilities of a lost hiker or assess the medical condition of a fallen climber ten miles from the roadhead. In addition we must be aware of our own limitations and what can and cannot be done to improve or preserve them.

1. Wilkerson, James A., M.D., Ed., **MEDICINE FOR MOUNTAINEERING**, second edition, The Mountaineers, Seattle, Washington, 1975. An excellent advanced first and second aid manual with contributions from a wide range of physicians and physiologists. Presently used as a required text by the Vail Mountain Rescue Team EMT mountaineering medicine program — a physician instructed course. Available from book and mountaineering stores.

2. Yosemite Institute, Proceedings, **MOUNTAIN MEDICINE SYMPOSIUM — YOSEMITE**, 1975. Planning officer, Charles S. Houston, M.D., Planning Coordinator, Stanley L. Cummings, Ph.D., October 29 — November 1, 1975 Yosemite National Park, Calif. Available from Yosemite Institute, Yosemite Park, Yosemite, California 95389. 1975 Symposium Proceedings available for \$8.10 which includes postage. A synopsis of the latest theories on frostbite, hypothermia, high altitude pulmonary edema, mountaineering nutrition and hot and cold weather survival. Definitely a must for the practical AND esoteric minded.

3. Clarke, Charles; Ward, Michael; Williams, Edward; Editors; **MOUNTAIN MEDICINE AND PHYSIOLOGY: Proceedings of a Symposium for Mountaineers, Expedition Doctors and Physiologists**. Sponsored by the Alpine Club, 1975. Held by the Alpine Club at the National Mountaineering Centre Plas Y Brenin, Capel Curig, North Wales, 26-28 February, 1975. Available from Mountain Safety Research, Inc., 631 South 96th Street, Seattle, Washington 98108. Topics covered in technical but extremely readable fashion. Some topics included are Cold, Endocrine, Nutrition, Hypoxia, Fitness and Fatigue and Expedition Health.

4. O'Shea, John Patrick, Ed.D., **SCIENTIFIC PRINCIPLES AND METHODS OF STRENGTH FITNESS**, second edition, Addison-Wesley, 1976. An exercise physiologist and researcher at Oregon State University as well as a mountaineering instructor O'Shea puts forth information directly applicable to those persons in an outdoor/mountaineering environ-

(Continued on page 36)

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# 'ONE WALKED AWAY'

From the WINTER '76 SEARCH & RESCUE MAGAZINE



### **A Critique by CARL HELLER, OPERATIONS LEADER, CHINA LAKE MOUNTAIN RESCUE GROUP**

The plane was on a flight across the Sierras from Oakland to Death Valley and the pilot had filed a flight plan. The crash occurred about 1400 on Monday, and the plane was missed before dark.

According to a scenario based upon the National SAR plan of 1973, a SAR Coordinator and Search Mission Coordinator would have been selected and an air search started immediately. Air search from both sides of the Sierras would have found the plane Monday or Tuesday, since it was close to its planned route. By Tuesday afternoon either ground teams or a hovering helicopter H-53 (based within one hour's flight) would have rescued the pilot and passengers.

#### **The Political Barrier Hampered Our Work**

The actual scenario was different and ended Wednesday with one survivor walking out and two bodies on the mountain. Many people and aircraft had been involved in the search, but not under an organized plan, and, in fact, were unaware of each other's involvement. To the best of my knowledge, the air search units from Owens Valley were not involved in the search. The pilot's friends flew in from the west to search. Sequoia Park had some search activity. The plane making the first spotting on Tuesday was out of Bishop but was flying for the Park. After the spotting, the Eastern units were still not involved, while the Park people intensified their efforts. The incorrect location given by the original spotter was well inside the Park, but definitely physically closer for planes, helicopters and ground teams from the east—it was the largest political barrier.

When the one passenger walked out to the east in Independence, the Eastern operation began.

*(Continued on page 37)*

## EMT PLAN (Continued)

ment. Topics include training programs for both strength and cardiovascular fitness.

5. American Alpine Club, The, AMERICAN ALPINE PINE JOURNAL, 1976. "Altitude Illness — 1976 Version," Charles S. Houston, M.D., "HAPS (High Altitude Physiological Study, Mount Logan)," Charles S. Houston, M.D. The first article condenses current thinking with extensive bibliography and the second article traces the history of a unique and little publicised research center in Canada.

6. Mitchell, Dick, MOUNTAINEERING FIRST AID, A Guide to Accident Response and First Aid Care, 1972. The Mountaineers, Seattle, Washington. A well known book entirely oriented to the outdoorsman/mountaineer which emphasizes field improvisations. Authored by an EMT and mountaineering instructor.

Other related articles from climbing and mountaineering publications as well as medical journals are available on request. ■



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*(continued from previous page)*

since no earlier coordination had been established, it took a while for the two operations to become one. Once they did, it took about two and one-half hours for a helicopter with a ground team to locate the wreck. Once the helicopter get "permission" to land the ground team, it took another hour to reach the site. The above times indicate that a coordinated operation could have gotten help to the site Tuesday noon when the pilot was possibly alive.

### Conclusion

This is written in hopes that our operation leaders who become Search Mission Coordinators or On-Scene Commanders will think big. Ask for all the search resources you think usable. Spend telephone time and funds. Plan for all the Search and Rescue units which are made available and use them within their limitations and unit (or command) rules.

I would like to see the National Search and Rescue plan working as proposed and the units used to best advantage. Certainly there will always be some local pride in units or political entities, but the Search Mission Coordinator and On-Scene Commanders should try to utilize all available resources in a coordinated plan.

The search resources for the High Sierra region include the following (with numbers of people

eventually involved in the present operation shown):

East	Air	Land
Inyo Sheriff . . . . .	2	3
Inyo Possee . . . . .	0	8
CAP, Bishop and China Lake . . .	0	0
Naval Weapons Center . . . . .	0	1
Edwards AFB . . . . .	3	1
CLMRG . . . . .	1	11
Forest Service (Seasonal) . . . . .	0	1
Nellis AFB (H-53 helicopters) . . .	(1)	standby
<b>West</b>		
Sequoia Park . . . . .	5	7
Sequoia Forest (Kernville) . . . . .	0	0
Tulare Co. Sheriff and Posse . . .	0	0
<b>Coordination</b>		
RCC, Scott AFB . . . . .	0	(1)
OES, Sacramento . . . . .	0	0

We have phone numbers for all these units or organizations on our Alert Sheet. The numbers listed on this operation are not typical. For any one operation some units will help and some will help and some will have to turn you down depend-upon circumstances and, of course, political boundaries. The volunteer teams and military units are most apt to respond regardless of boundaries.

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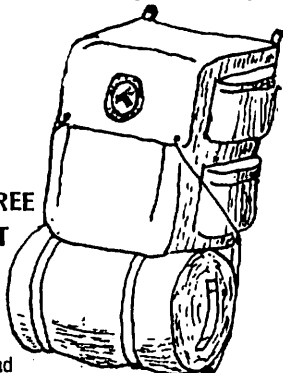
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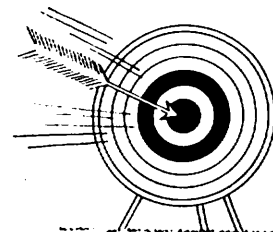


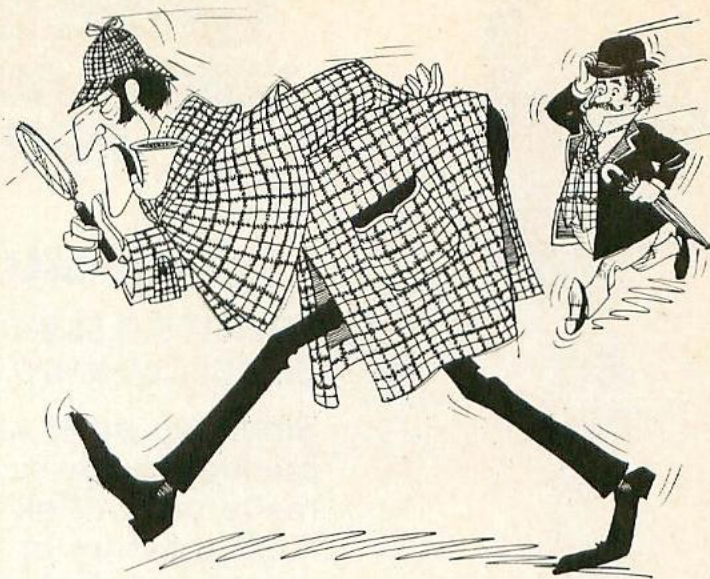
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