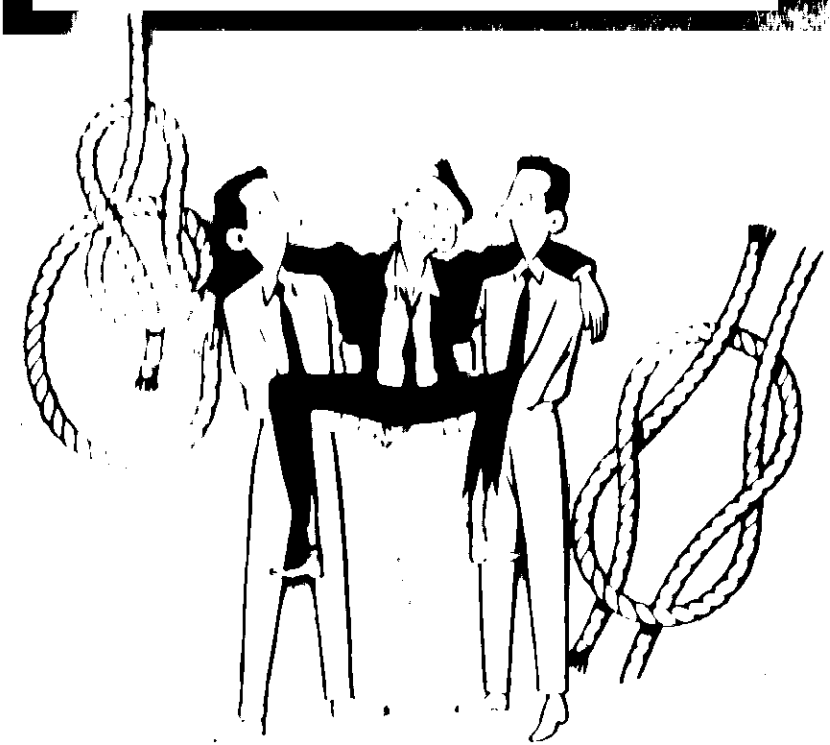
Basic
RESCUE SKILLS

CANADA EMERGENCY MEASURES ORGANIZATION



Basic
RESCUE SKILLS

CANADA EMERGENCY MEASURES ORGANIZATION

Published by
Emergency Measures Organization
Ottawa, Ontario,
Canada.

FOREWORD

The object of this booklet is to teach the fundamental skills of rescue work. It is not a complete technical manual and those wishing to study this subject more extensively should seek more detailed instruction.

The rescue skills outlined in this booklet may be learned and practiced using the materials and know-how available in any community in Canada — in any city, town, village, factory or farm.

Much of the technical knowledge required for instruction in rescue work can be obtained from the emergency measures rescue or the fire services. These men have a vast fund of knowledge and experience that will stand them in good stead in training others for rescue work in disaster.

INTRODUCTION

Whenever a natural or man-made disaster takes place people are likely to be trapped in the wreckage of their homes or places of work. Many of them will die unless they are rescued quickly.

This is the job of the Rescue Services of the Emergency Measures Organization.

It takes more than just willing hands to save lives. Untrained people may endanger themselves and those they are trying to rescue. The purpose of this book is to teach you the basic skills of rescue work.

SKILLS

Every rescue worker must have a knowledge of ropes, knots and lashings. He must know how to use jacks and levers, chain hoists and ladders. He must learn about shoring up buildings with materials found on the spot. He must know how to handle casualties and attend a first aid course at the first opportunity.

And, there is another thing he must learn . . . *to stay alive himself while he is rescuing others.* To do this he must understand something about the way buildings are constructed and how they collapse. He must learn to work as safely as possible in collapsed buildings, rubble and debris.

BUILDING CONSTRUCTION

Modern factories and office buildings are framed in steel. They will stand firm, or only twist, under anything less than a direct hit. Most neighborhood business premises and homes, however, have little structural support. They will almost certainly collapse under unusual violence.

Rescue workers must understand the patterns in which particular types of buildings collapse, both for their own safety and in order to save others.

The extent of damage depends on the type of construction and the distance of the building from

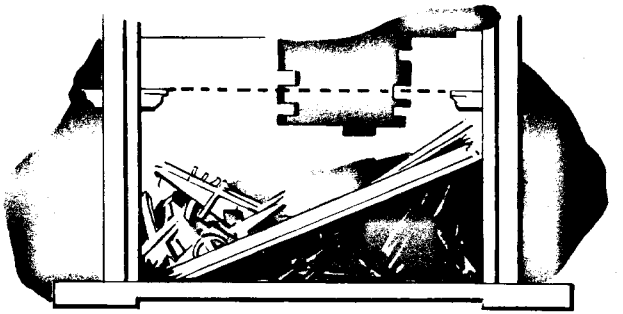
the place where the bomb exploded. But you may be sure that the walls are weakened and the floors may give way at any moment.

Buildings suffer similar damage from bombs, earthquakes, tornadoes or floods. If you know how to rescue people in one case, you know how to do it for all cases.

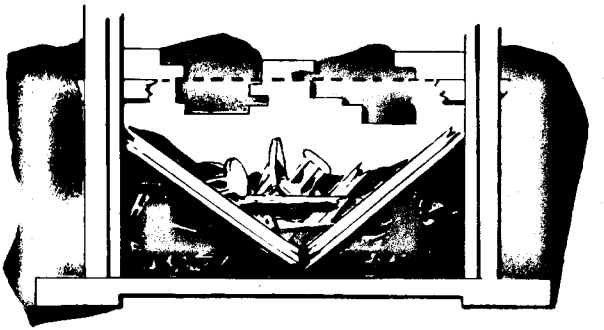
In any event, the building will be filled with heaps of rubble and debris. Don't let untrained people poke around it. They may cause further collapse.

FORMS OF COLLAPSE

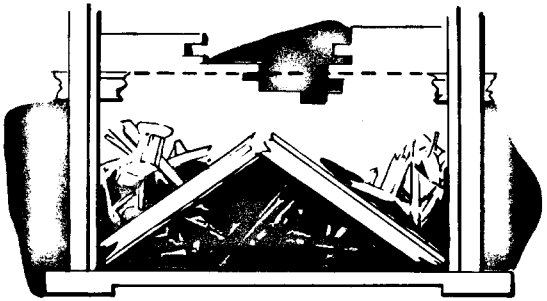
Most un-reinforced buildings collapse into more or less predictable patterns. Often the collapse forms what we call "voids" where people may live for some time. Rescue workers must know how to locate and search these voids.



When floors drop on one side and hang to the wall on the other, a "lean-to" void is formed. They are often large and are relatively easy to reach.

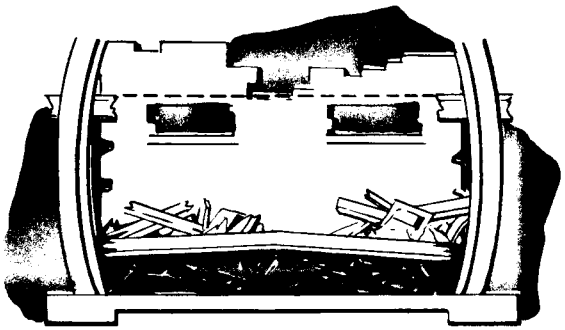


Sometimes the floor collapses in the middle, forming a "V" shaped pile of debris in the centre with voids on either side. Occasionally the centre of the floor holds up and both sides collapse, form-



ing an "A" shaped void. These voids are more difficult to reach.

Occasionally, when the walls spread outwards, the floor falls straight down. Often it is stopped



by furniture and a shallow, flat void is formed at the bottom. This type of void is extremely hard to reach. If is often dangerous.

PRECAUTIONS

Don't enter a damaged building, no matter how urgent the situation appears, without advice or a careful checkup. Concentrate on searching the fringes and trying to locate casualties by

calling out. Remember, you won't help anybody by becoming a casualty yourself.

When it is decided to enter the building, look out for unsafe walls, blocked or jammed doors, weakened stairways, projecting glass fragments, splintered woodwork, projecting nails and spikes, escaping gas, flooding of basements and exposed wiring.

Study the collapsed building first. Maybe you're impatient about the delay, but the study will pay off. Tell someone where you're going or, better still, work in pairs. Move slowly and test each step. Walk close to walls. Walk backward and close to walls when descending stairs.

don't

pull at projecting debris.

don't

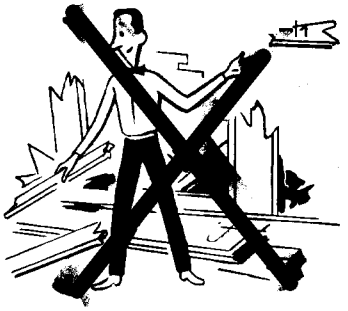
smoke or light matches.

don't

touch *any* wires.

don't

throw debris aimlessly.



In short, don't trust anything. Move quickly . . . but cautiously. Wear whatever protective equipment you can. Helmets, gloves, etc., may save your life.

OBEY ORDERS STRICTLY

How to Acquire the "Supplementary Skill"

To stay alive in rescue work you must understand the dangers you may meet and the precautions you must take. This is the "supplementary skill."

In any neighborhood new buildings are constantly going up and old ones are being torn down. Study them. Learn how houses are made.

To get experience at working in voids, you can simulate collapsed houses by building "rafts" of old lumber. Lean them against walls to form the type of void you wish. Pile on old crates, etc., to make it realistic. With two such rafts you can simulate any type of void. You don't need a lot of money if you have a little imagination.

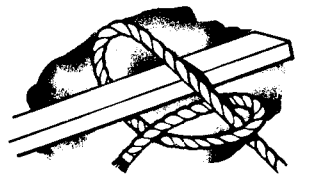
Rescue teams often must use whatever comes to hand. Learn to improvise. Make a list of the tools owned by neighbors. List particularly ladders, car jacks, axes, carpenters' tools, blankets, rope, first aid supplies and garden tools. Know where you can lay your hands on them at a moment's notice.

RESCUE SKILL No. 1

Knot tying. Use of Rope

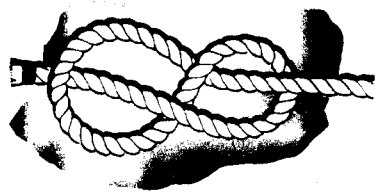
There are five elementary knots and one hitch that you must learn in order to be a good rescue worker. Lives may depend on your being able to tie the right knot securely at the moment it's needed in light or dark, rain or shine. You can practice these knots on a piece of clothesline or heavy cord.

HALF-HITCH



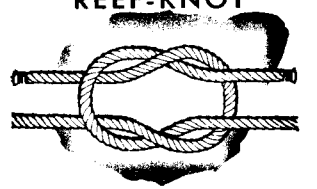
Used to fasten an object so that one loop bites the other without actually knotting.

FIGURE-OF-EIGHT KNOT



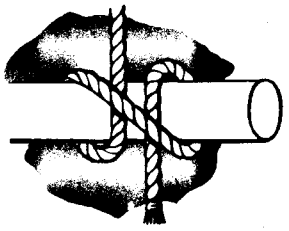
Used mainly to stop a free end of rope from running through a pulley, etc.

REEF-KNOT



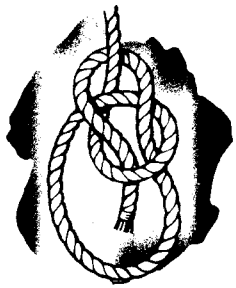
A useful knot for general purposes. Used mainly for joining ropes of equal thickness.

CLOVE HITCH



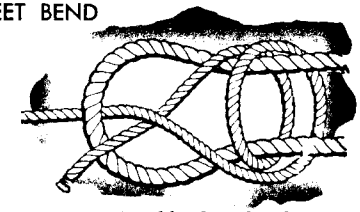
A quickly-tied hitch which forms the basis of many securing knots. Useful for anchoring a rope to an object.

BOWLINE



Makes a loop that won't tighten. Useful for lowering or hoisting casualties.

SHEET BEND



Double sheet bend

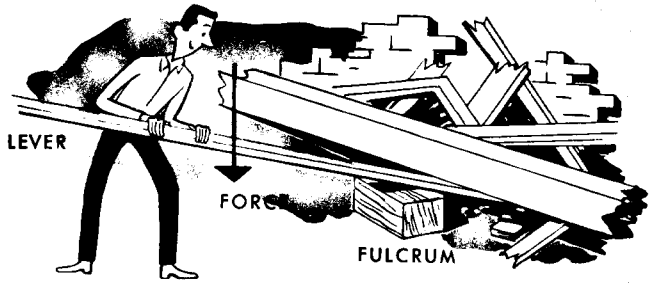
A sheet bend is used for joining two ropes of different sizes.

The double sheet bend is more secure than the single sheet bend and is used when there is a great difference in the size of the rope as shown here.

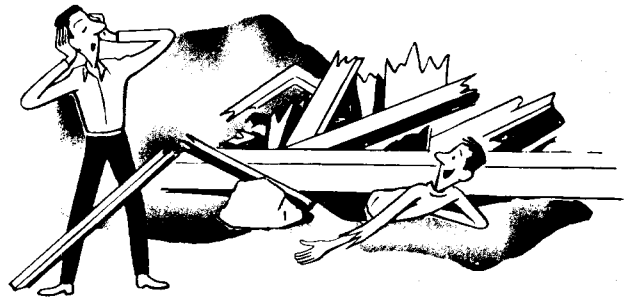
Both bends have the advantage that they do not slip when the rope is wet.

RESCUE SKILL No 2
Use of levers and jacks

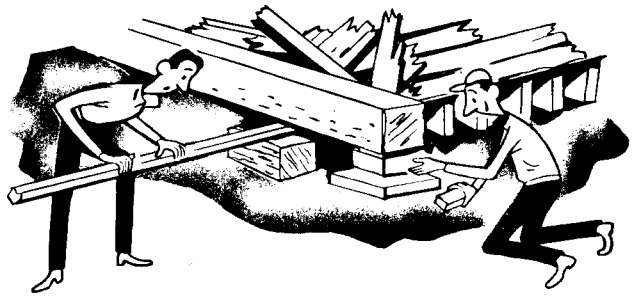
When buildings collapse, people are frequently pinned under falling debris. Often this debris is too heavy to lift by hand. You must, therefore, be able to use levers and jacks.



A *lever* is a device that gains power by sacrificing distance. It works like this . . . Any sturdy piece of wood or metal will make a lever. Any solid piece of masonry, etc., makes a good fulcrum. Learn to improvise.

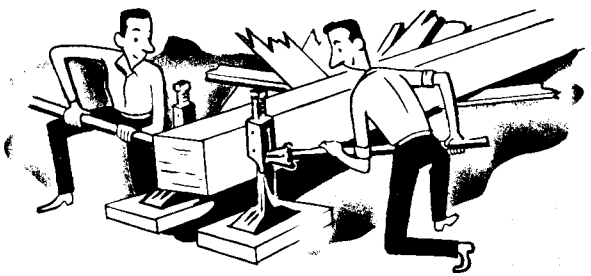


Make sure the fulcrum is placed so it won't sink under pressure. If the load slips or your



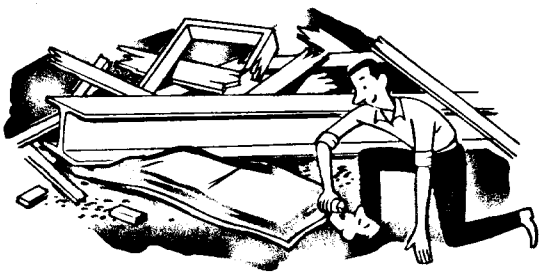
lever collapses, the victim may be injured even more. Always work from a secure position, keeping both feet on the ground.

The best way to use a lever is to make a short lift. Then put in a secure block to hold the gain. Then another short lift and another block. Don't use levers casually. They can be dangerous.



A *jack* is a mechanical device designed to lift heavy loads. You can use it in a more confined space than a lever. But it also needs care and practice to be used safely. You can practice using levers and jacks with equipment like this.

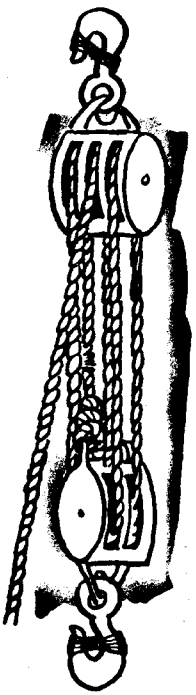
Note: Before attempting to release a pinned-down victim, give him at least a pint of liquid. *Always.* If you fail to do this he may die.

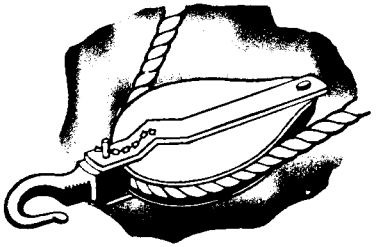


RESCUE SKILL No. 3

Blocks and Tackle

A block and tackle is a rope device which permits a rescuer to lift heavy weights. The more sheaves to the block, the greater the mechanical advantage. They look like this.



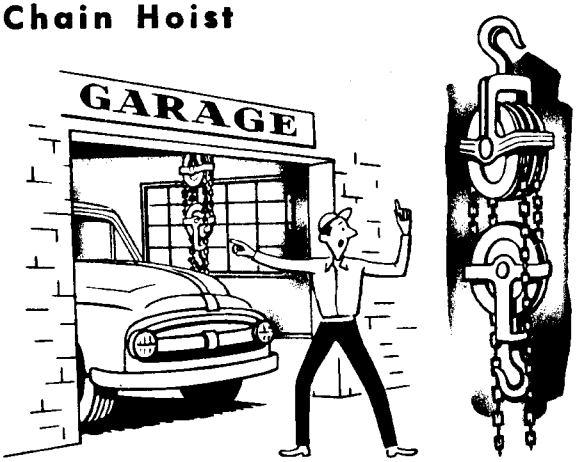


SNATCH BLOCK

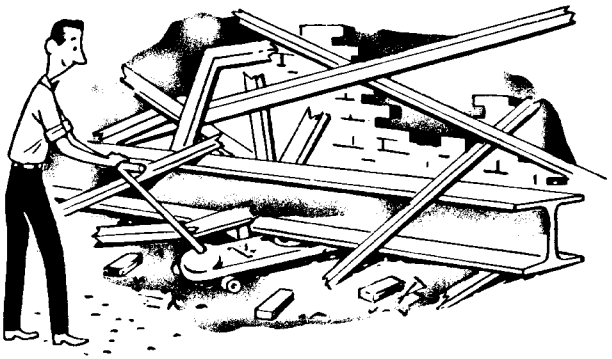
Some blocks can be opened from the side to allow easier threading of the rope. They are known as snatch blocks. Used properly, block and tackle can help your rescue team lift almost any obstacle, to raise or lower injured people from great heights.

RESCUE SKILL No. 4

Chain Hoist



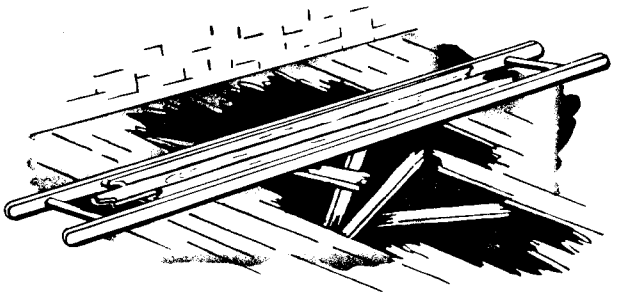
Winches, chain hoists and gear-lifting tackle are found in most garages and a garage owner is a fine addition to the rescue team. Chain hoists are useful but are hard to work at night. They are



not practical for horizontal pulls. A gear-lifting device (Pul-Lift) has the advantage of no loose chain to get in the way. It takes little space and can be set up quickly.

RESCUE SKILL No. 5

Ladders

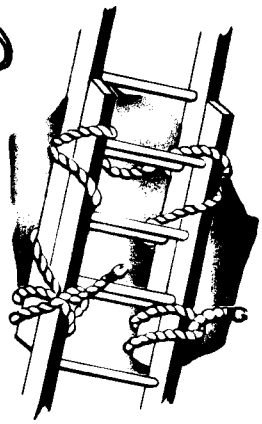


as a Bridge

Ladders are valuable pieces of rescue equipment. They can be used for bridges, derricks, stretchers, etc.

Leaning Ladder Method

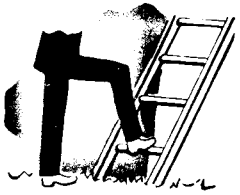
BOWLINE



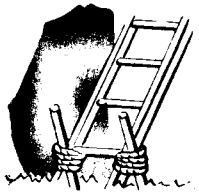
Two short ladders may be lashed together to make a longer one. Do it this way. Never tie on the rungs. Always the beams (sides.) Keep the knots on the under side.

To erect a ladder, have one man "foot" it to prevent slipping. Or lash the bottom of the ladder to some secure object.

When using a ladder as a bridge, make sure you've left plenty of overlap at each end. Place boards over the rungs to improve the footing.

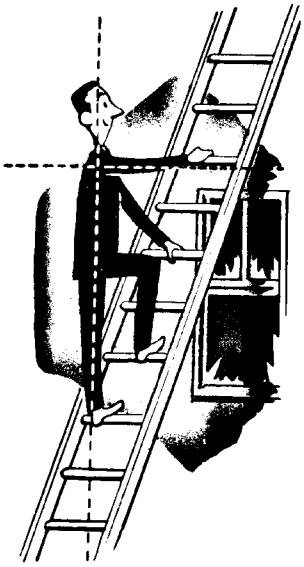


OR



To Climb a Ladder

Hold onto the rung, *not* the beam, unless you're carrying something. Stand on the centre of the rungs. Look *up*, not *down*.



If you must stand still on a ladder, lock your position by passing one leg through the rungs, gripping the rung with the knee.

Setting it Safely

To determine how far the base of the ladder should be placed from the wall, divide the height by four.

RESCUE SKILL No. 6

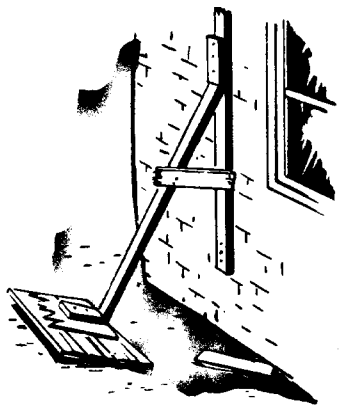
Strutting and Shoring

Once you've lifted fallen debris — or if a structure is apt to collapse further — you should shore it up with timbers. Strutting is the same process applied to doors and windows.

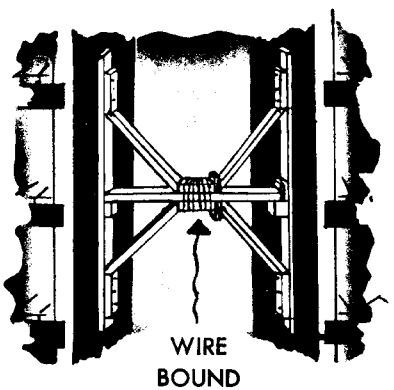
There are three main types of shoring — raking, flying and vertical (dead shore). Don't overdo things with shoring. The idea is support not reconstruction.

The Raking Shore

This is intended to hold a bulging wall from further collapse. As the value of this shore depends on its rigidity, common sense is the best guide in locating it in a firm place.

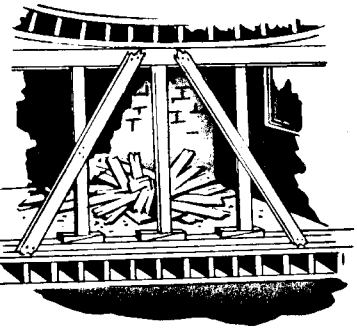


The Flying Shore



This shore uses a sound wall to support a sagging wall. It can be used for walls up to 25 feet apart. You'll see from the diagram that it is really only a series of four raking shores, each based on the horizontal beam holding the wall plates in position. A raking shore can do almost anything a flying shore can do, and with a lot less fuss.

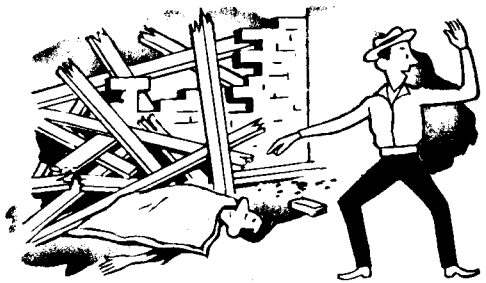
The Vertical Shore



This type of shore bears a lot of weight. Therefore the sole piece should be very solidly placed. It should be as wide and as long as possible. Remember, the shorter the shore, the better it will carry a load.

RESCUE SKILL No. 7

Emergency Handling of Casualties



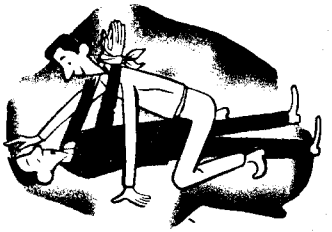
Getting the injured out of danger and into medical care is the prime purpose of all rescue work. But unless the casualty is in serious danger of death by remaining where he is, you should always attempt to stop bleeding before trying to move him. These are the things to do when you locate an injured person.

Keep the patient warm to reduce shock. Clear dust and dirt from his mouth and nose and protect the victim from falling debris. If necessary—and if possible—give artificial respiration. If clothing is caught by debris, cut it free. Don't move the debris as you may cause further collapse.

Never move the casualty about more than you have to. If you can't obtain a stretcher, try one of these emergency methods.

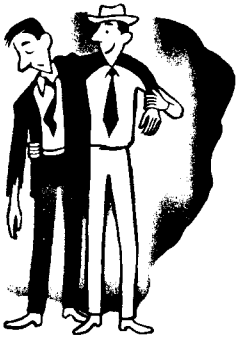
If you're alone and must move the casualty quickly:

FIREMAN'S CRAWL



Use a triangular bandage, a torn shirt, etc., to tie the casualty's hands together. This way you can move a person much heavier than yourself.

HUMAN CRUTCH

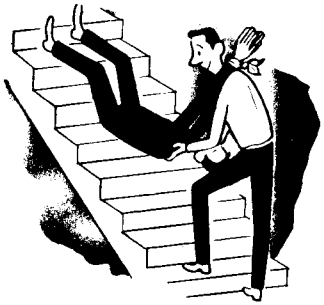


Only for casualties who can help themselves. This is the ordinary way to move the lightly hurt.

PICK-A-BACK

Simply lift the casualty onto your back. Don't try it if he is not conscious.

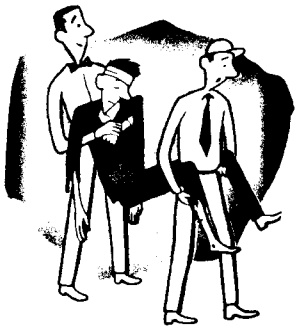
REMOVAL DOWN STAIRS



Don't try this if the victim has broken limbs.

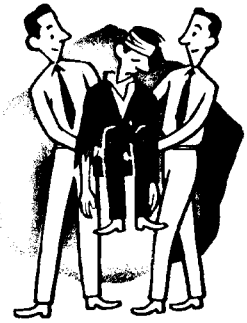
If there are two of you to do the carrying:

THE FORE AND AFT METHOD

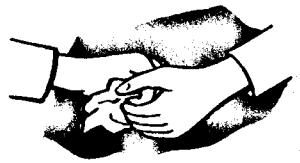


A useful method if the injury is not too serious. An unconscious person can be carried this way, but a broken leg means you'll have to tie the limbs together and carry them under one arm.

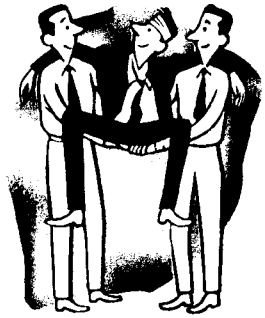
TWO-HANDED SEAT CARRY



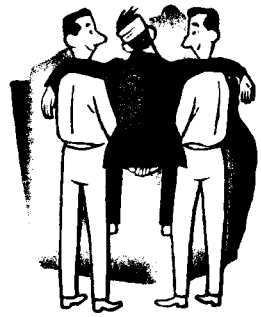
Another good way to carry an unconscious casualty. Always use the hook grip and pad your fingers with a handkerchief to prevent cutting your partner's fingers with your nails.

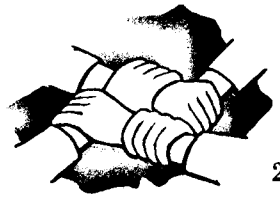


FOUR-HANDED SEAT CARRY



A good carry for a conscious victim.





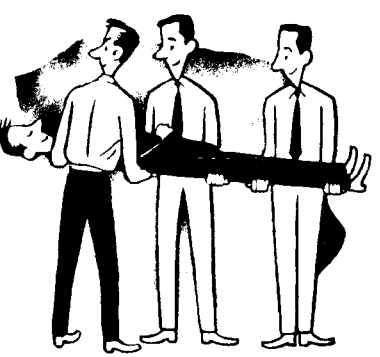
CHAIR LIFT

Make sure the chair is strong enough to bear the weight.

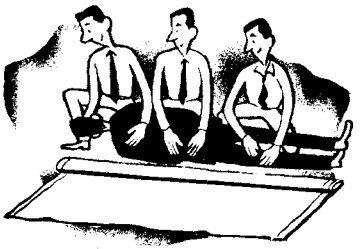
If there are more than two of you to do the job:

THREE-MAN LIFT AND CARRY

This is an excellent way of lifting a badly-hurt person without complicating his injuries. He can be carried forward, sideways or lowered onto a stretcher. This method is recommended for getting a badly-hurt person out of a confined space and down difficult stairways.

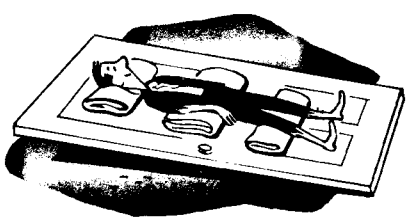


FOUR-MAN LIFT AND CARRY



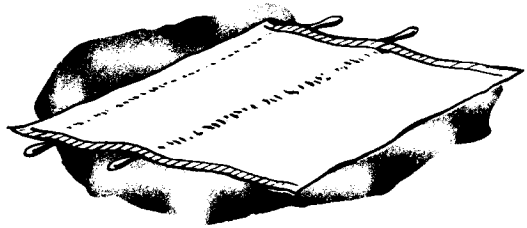
Use this method when you can't employ a stretcher. Don't jar the patient any more than you can help when you roll him onto the blanket. Roll the edges of the blanket to form a handhold.

IMPROVISATION

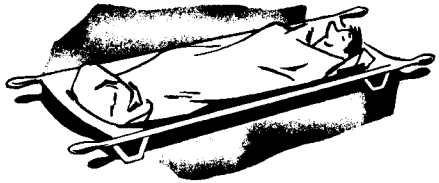


Doors, short ladders, sheets of galvanized metal, etc., can all be used to improvise stretchers. The good rescue man always has an eye out for suitable materials.

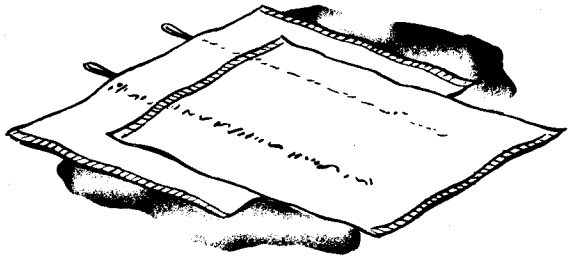
BLANKETING STRETCHERS



When only one blanket is available, do it this way. This gives the casualty something to lie on and also something to cover him.

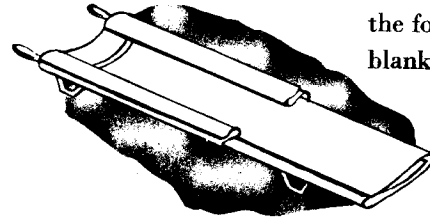


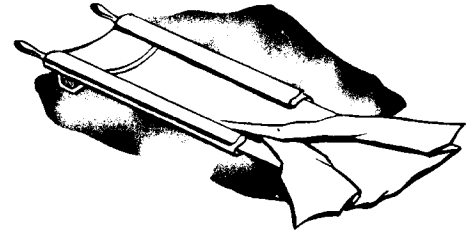
Where two blankets are available



Where two blankets are available, put them on like this, with the second folded in three. Then open out the folds of the second blanket at the lower end for about two feet.

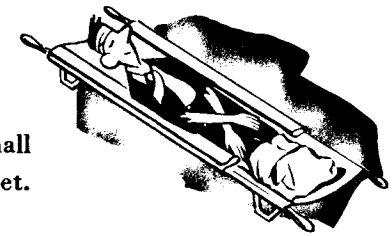
Place the patient on the four thicknesses of blanket and bring the



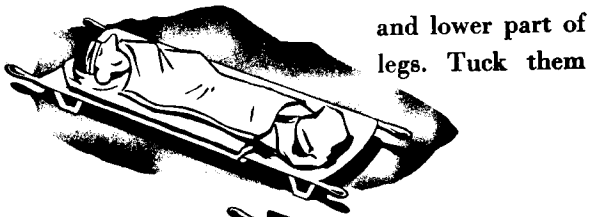


foot of the second blanket up over the

feet, tucking in a small fold between the feet.

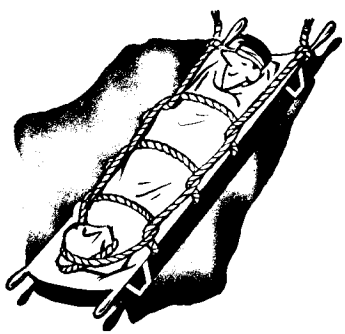


Now bring the sides of the folds of this blanket over the feet and lower part of the legs. Tuck them in.



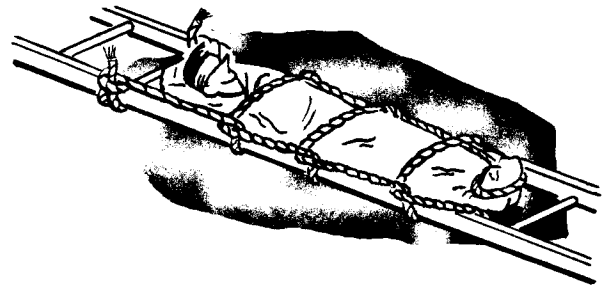
Turn in the upper corners of the first blanket and bring the shorter end over the patient. Then bring the longer end over and tuck in well.

LASHING CASUALTY TO STRETCHER



Whenever a casualty must be carried over uneven ground or over debris, he must be lashed to the stretcher. Clove hitches are used. Lashing should be applied to a stretcher this way.

Sometimes a ladder must be used as an emergency stretcher. Lash a casualty to a ladder this way. Start above the head.



Doors, iron railings, tin roofing sheets or even planks can be used as stretchers, but none of these is suitable for vertical rescue as no suitable lashing can be done.

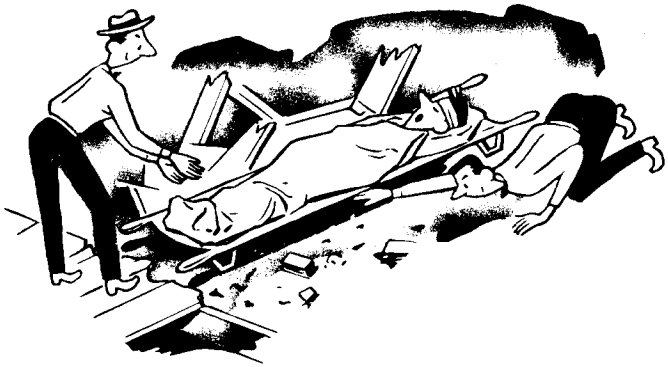
Remember, your casualty will be hurt and in pain. Treat him accordingly.

PASSING STRETCHERS OVER OBSTACLES

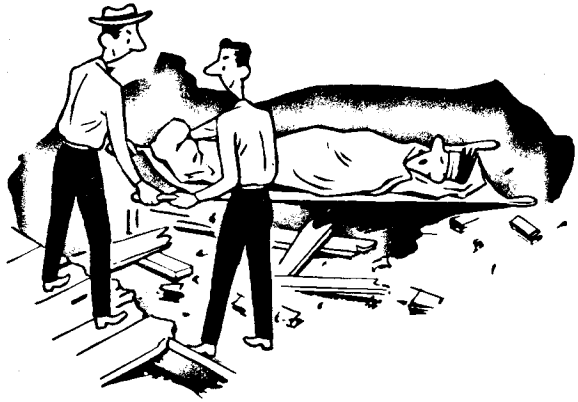
Normally four people are needed to carry a stretcher, although two are sufficient when the ground is level and there are no difficulties. Sometimes, when taking a patient over rubble or piles of debris, six or eight bearers may be needed. If only four are available, and a rough passage is to be negotiated, do it this way.

Place one man at the front, one at the back and one at each side. The side bearers should take the weight while the front man gets firmly set. Then the side men go to the rear and help the back man move forward. They then support the stretcher while the back man gets set. Repeat this motion as often as necessary.

If only two men are available, place the stretcher on the ground on its "D's". Make sure the canvas bed is clear of rubble. The man on front takes a firm stance and the rear man raises the front end



as close to horizontal as he can. Then the rear man returns to the rear end and raises the stretcher. Each obstacle should be negotiated in this manner.



Note: Bystanders can be pressed into service as bearers, but should never be allowed to act on their own without trained direction.

FIVE STAGES OF RESCUE

No hard and fast rules can be laid down for rescue work but, generally speaking, there are five stages of rescue followed by trained rescue teams. They are:

stage 1: Examine the site. Deal with surface casualties. Gather all possible information about other occupants.

stage 2: Search fringes of damage area for casualties. Maintain contact with casualties inside who can be seen or heard but cannot be moved immediately.

stage 3: Search ruins and rescue all persons who can be seen or heard.

stage 4: Search farther into the collapse where chances of the trapped remaining alive seem remote.

stage 5: Strip selected areas of debris until all supposed casualties are accounted for.

VISUAL AIDS

"Rescue Party"
"Five Stages of Rescue"
"Rescue Reconnaissance"

Check with your Provincial E.M.O. for availability of visual aids.

IMPROVISATION

You don't need a lot of expensive equipment to practice rescue work. Ropes, levers, jacks and ladders are available for the asking from many sources. "Mock-ups" of wrecked houses can be created using discarded crates, boxes, sacks, etc. If the real thing comes, you'll have to improvise. Learn the tricks now.

DO IT IN THE DARK

To be a good rescue man you must master all the skills we've outlined in this booklet. You should be able to do them in the dark. Practice tying knots blindfolded and in cramped quarters.

In most places you can find a Casualty simulation group who'll provide realistic-looking victims. Take advantage of them.

Practice whenever you can. Some day you may help save many lives.

SOME DO'S AND DONT'S

DO make a reconnaissance before you start work. The time will not be wasted.

DO examine a casualty before removal and see that you give the correct first aid treatment.

DO free the nose and mouth of a casualty from dust and grit and so ease his breathing.

DO protect a casualty from falling debris and dust by using blankets, tarpaulins, corrugated iron sheets, etc.

DO be careful how you move debris from the vicinity of a casualty.

DO keep a casualty warm and so reduce shock.

DO make sure that the stretcher is properly blanketed so that the casualty has the maximum amount of warmth and comfort.

DO remember the right way to carry a stretcher over debris and obstacles.

DO remember to keep a list of all casualties dealt with.

DO keep off wreckage as much as possible and leave it undisturbed or the neutral voids may be destroyed by further collapse.

DO be careful how you remove debris and obstacles, especially from voids, to prevent further collapse.

DO remember it is often necessary to put a simple prop or strut to strengthen a floor loaded with debris before passing over or working underneath it.

Do use gloves when removing debris by hand.

Do remember to exercise great care when using sharp tools in debris.

DO walk as close as possible to the wall when on damaged stairs and upper floors.

DON'T move an injured person without rendering first aid unless he is in immediate danger.

DON'T smoke or strike matches in case there is an escape of gas.

DON'T crawl over debris or disturb parts of the damaged structure unless you are compelled to by circumstances.

DON'T pull timber out of the wreckage indiscriminately or you may cause further collapse.

DON'T enter dangerous places without informing the other members of your party, or if possible, without a companion to help in case of accident.

DON'T touch loose electrical wiring.

DON'T throw debris aimlessly on one side—you may have to move it again.