The St. John Ambulance Brigade

(VICTORIA)

RESCUE SQUAD

TRAINING MANUAL

PREFACE

ST. JOHN AMBULANCE BRIGADE

VICTORIA DISTRICT

These lectures have been prepared for the training of the Brigade's Rescue and Mobile Squads in this District.

LECTURE No. 1 — Survival and Rescue in Fires by District Officer M. D. Phelan, S.B.St.J.

LECTURE No. 2 — Cliff Climbing and Rescue by Sergeant J. Leonard.

LECTURE No. 3 — Map Reading and Navigation by Sergeant J. Leonard.

LECTURE No. 4 — Physical Training Programme by Sergeant J. Leonard.

This training manual is authorized by the Commissioner, Colonel Douglas Donald, K.St.J., E.D.

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ST. JOHN AMBULANCE BRIGADE
VICTORIA DISTRICT

SURVIVAL and RESCUE in FIRES

By M. D. Phelan, District Officer

FIRES IN BUILDINGS

Preservation of Life in the Case of Fire

Duties as Member of Public:

1. Call Fire Brigade if first on scene.
2. Obey instructions of Officer-in-Charge of Fire Brigade.
3. Do not obstruct members of the Fire Brigade at the scene of a fire.

Entering a Building involved in Fire:

Don't unless life in the building is in danger.

If found necessary, if possible, work in pairs.

1. On arrival at scene, ascertain if any persons are thought to be in the building — if so, try to determine their most likely positions where they were working — playing — sleeping, etc. Make a check list of occupants if possible.
2. If entering the building before arrival of Brigade, leave message for Brigade Officer.

Opening Doors:

1. In search of persons: if door seems jammed, don't use axe, etc., to batter in lower panels — a body may be on the other side. If possible, remove panels above possible position of unconscious person.
2. If door is hot to touch, or fire is suspected on the other side of the door, the door should not be opened without reasonable certainty that persons are trapped on the other side.
3. A door should also be used as a shield when opened to ward off severe heat.

N.B. It should be well remembered that a building becomes pressurized in a severe fire and becomes explosive, so care should be used when opening doors.

A fire may be temporarily retarded by closing all doors to the affected area of the building, this restricts the spreading of the hot gases and of smoke. Another point to be remembered is that fire cannot exist without air; a closed door sometimes temporarily limits air supply.

Precautions re Moving in a Building:

Movements of all personnel in a building involved in fire must be with the consent and under the directions of the Fire Officer-in-Charge.

Floors:
If "live" springy — movement should be confined to the side where stability is more likely.

Stairs:
In ascending or descending stairs, persons should keep near to the walls, testing the treads before placing weight on same.

Smoke:
Keep to lower levels if heavy gases are not suspected. Wet fingers and test for draught — follow against draught to entry of fresh air whether door or window.
By keeping close to the floor in a smoke-filled room, you are able to move in comparatively smoke-free conditions and the air is usually cooler.
If concentration of smoke is extremely heavy, wet sleeve and breathe through it.
Don't stand in a doorway where smoke is thick. This is obvious as a large volume of smoke in a room is concentrated as it exhausts through door.
To leave or enter a building in smoke conditions, follow fire hose. The male coupling of the hose faces the fire end of the hose.
Fire Street
Finding a doorway in dense smoke, work your way around room by feeling skirting to architrave of doorway. This also is a safeguard to falling over furniture. Beware of cupboards (a cupboard has a handle on outside only.)
Beware of natural voids consistent with the occupancy of the building — stair wells, etc.

Collapse in Walls and Ceilings:

Cause —
1. Unequal heating of surfaces.
2. Sudden cooling of surfaces.
3. Expansion of lateral steel beams, etc.

Effect —
Bulging of wall surfaces.
Cracks in brick work.
Bricks dislodged.

Precautions —
Area zoned off as restricted area to all personnel and is barricaded.

In Event of being involved under Collapse —
1. If outside — shelter under any available archway, doorway, truck, car, etc.
2. If inside — shelter under, above or under or beside any heavy articles of furniture.

Protective Helmets should be worn (falling debris).

Electrical:
Electricity should be turned off at the main switchboard.
To guard against injury from electrification of building, machinery, etc., caused by damage to electrical wiring, the following precautions should be adhered to:

1. Don't touch any wires if avoidable.
2. If moving in smoke concentration, your leading hand should be extended so that the back of the hand is forward.
3. Where overhead cables are damaged at the insulation, or are down, avoid all puddles, etc., with which the cables may be connected.

All electrical fires become ordinary fires when the power is cut off.

Personal Protection:
Two elementary principles: Wet cloth or handkerchief placed over mouth and nose gives some protection against smoke. Placing the nose close to a fire hose you get a certain amount of air coming through under pressure with the water.

Escape:
Air clearest and coolest near floor. Crawl with free hand raised in front to feel for obstructions. **When using stairs keep close to wall, go down backwards feeling with foot for each step.** Often possible to escape by dropping from a window on to the roof of an outbuilding, such as a wash-house or projecting kitchen, and so reaching the ground. Make certain that a "drop" can be made with safety — that something in the nature of a glasshouse or a railway line or cutting is not immediately below. If dropping from a window, grip sill and lower self to full extent of arms, then let go and drop.

Rescue:
Advisable to work in pairs on entering smoke-filled room; make complete circuit of room keeping close to wall, feeling under and on beds and inside cupboards; finally cross room diagonally to ascertain if anyone lying in centre. **To move an insensible person, turn him on his back and tie his wrists together; kneel across him and place your head through loop formed by his arm; and then crawl dragging him with you. To move an insensible person downstairs, lay him on his back, head downwards on the stairs, place your hands under his armpits so that his head rests on the crook of your arm, then ease him gently downstairs.**

Clothing on Fire:
If another person's clothing is on fire, muffle in coat, blanket, curtain, etc., get on ground and roll over and over. Do not allow to remain upright, as flames lick upwards and produce serious burns of face and breathing passages. Do not hesitate to trip him up if he starts to run. If own clothing on fire, clap hand over mouth, lie down and roll, using if available a mat, rug or carpet to roll up in.

Equipment found in Factories, Shops, etc., for Extinguishing Fires:
1. **Hose** equipped with branch, ¾" nozzle attached to turn-cock on walls of buildings usually in red box with glass-fronted door or solid box with "Fire" inscribed thereon. (100 feet of Hose Line.)
2. **Soda Acid — Extinguisher — Portable:**
   Use — To extinguish any small fire on which you would use water (curtains, furniture, etc.).

   To operate —
   Turn-over type. Grasp top handle and nozzle in left hand, placing thumb over nozzle. Place right hand, palm downwards, under extinguisher and grasp bar. Invert and shake extinguisher several

times, release thumb from nozzle and spray on to seat of fire.
Turn-over type fitted with stopper wheel. Same operation as above except wheel must be turned to left, the lugs riding up the shoulders, releasing acid inside extinguisher when inverted.

3. **Carbon Tetrachloride Extinguisher (C.T.C.):**
Can be RED or BRASS in colour.
Contents — 1 quart of C.T.C.
Use — For electrical fires, switchboards, electrical fires in motor cars.
To operate — Grasp barrel in left hand, with right hand turn handle of pump to left to unlock. Now use as a pump working above fire and allow resultant gas produced when liquid comes into contact with fire to descend on to fire and smother same. The gas produced is five times heavier than air. This gas is dangerous to life if inhaled to any extent. After use of extinguisher, get out into open air.

4. **Carbon Dioxide Extinguisher CO2:**
Usually RED in colour.
Contents — CO2 at 750 lbs. per square inch.
Use — To extinguish liquid or electrical fires.
To operate — Carry extinguisher as near as practicable to fire, hold director by rubber grip, withdraw trigger lock-pin, pull trigger and direct CO2 gas over the fire. Operate in short blasts. Extinguishes fires by lowering temperature and excluding oxygen — forms ice on fire. Don't hold Director Funnel—will freeze your hand.

5. **Foam Extinguisher — Portable:**
"BLUE" in colour — two types.
Contents —
Outer Container —
1½ gallons water.
1½ lbs. Bicarbonate of Soda.
2½ ozs. Liquorice or Quillai Bark.
Inner Container —
1 quart water.
2 lbs. 2 ozs. Aluminium Sulphate.
Use — To extinguish liquid fires of the Oil or Petrol type.
To operate —
Turn-over type. Operate same as Soda Acid.

BUSHFIRES

Bush Fires cannot be gauged on a slide rule as they vary greatly according to their location and intensity. These are only commonsense rules.
Work in groups, do not become separated.
Don't enter thick bush to fight fires. Where possible, wait until fire reaches open ground. Where not possible, watch fire does not pass overhead in tree tops. This is always a danger when fighting in heavily wooded country.
Do not lose contact with Base.

When attending at fires in hilly country, remain on the lee-side of hill on which fire is ascending as fire moves rapidly up these slopes carried by strong warm up-draughts.
Remember where your nearest road is in the event of a hurried retreat. It is wise to be within reasonable reach of some motor vehicle (leave keys in vehicle).
Do not fight fire in its direct path. Where possible, attack fire from edge. This protects you from being ringed by fire.
Firebreaks may be burnt against fire in suitable conditions from edges of roadway, ploughed fields, etc.
If trapped, shelter in creeks, rivers, dams, etc., not water tanks.

Methods of Rescue — Emergency:
Pic-a-Bac.
Human Crutch.
Fireman's Lift.
Fireman's Crawl.
Removal of patient by pulling coat up under head, patient lying on back (used for unconscious person).

Possible Equipment:
Carried in case of emergency when fire appliance not in attendance.
1. Axe.
2. Crow-bar.
3. Hydraulic gear—jack—porta-power.
4. Hand torch (motor cycle battery type).
5. 100 feet of rope line,. 2½ inches measured in circumference.
6. Blankets.

Clothing: What the well-dressed fire fighter should wear.
Bushfires usually occur on hot days and the natural tendency is to wear very light clothing — this is a grave error.
Shirt — Long sleeves are a MUST and a woollen shirt is best. The wool content makes the shirt less inflammable. A cotton shirt is easily ignited by flying sparks, embers and burning leaves and bark. The colour of the shirt does not matter much.

Trousers — Long pants, of course. The more wool in the material the better. Braces are better than belts as they allow circulation of air around the body under the shirts.

Shorts are Fatal — If a man wearing shorts is caught in burning grass or vegetation, he is really caught short. Besides, the more skin exposed to the heat of fire and sun, the quicker fatigue and heat exhaustion set in. In short, shorts will shorten the life of a fire-fighter.

Boots — Army-type boots are best for the heavy work of fire-fighting. They were the best to march in and a lot of walking over rough ground is called for at a fire. Boots prevent sprained ankles and are better protection on hot ground and embers. Woollen socks are the shot under boots.

Flannels — Flannels are better than singlets, but a woollen long-sleeved shirt takes the prize and is OK over a singlet.

Hat — Take a felt hat with you. Fire bosses say that hard hats are a must as they protect the head from falling limbs and other accidents.

A handkerchief around the neck stops hot ash getting down under the shirt and protects the back of the neck from sunburn and radiation from high flames.

Handkerchiefs — Take three or four handkerchiefs or sweat rags with you. A rag dipped in water is refreshing to wipe your face and you may need it to hold over your mouth and nose as protection from smoke and heat.

Eye Protection — Your eyes are particularly liable to soreness from smoke and heat. Flying ash and smoke can blind you. Medicinal paraffin oil is good protection and you should have a small bottle with you. Rub a few drops on your eyelashes and let some roll from the corner of your eye into the eye itself. Eye lotion is a good substitute. It is sold in small bottles complete with dropper. However, medicinal paraffin oil in one of these dropper bottles is best.

At the Fire:

The following things have caused the most fatalities or severe injuries:

Burning
Asphyxiation
Injury by falling limbs, or other accident
Heat Exhaustion
Electrocution
Reaction, Sickness, Chill, etc.

The biggest killer of all has been:

Panic in Emergency

Heat radiation from the fire is something that should be more fully understood. The human body can withstand amazingly high temperature for short periods but the radiation from a fire is something else again. It is infra-red radiation and it travels in a direct line. This is why as much of the body as possible should be covered by long-sleeved shirts, buttoned at the neck, hats well down. Radiation is the main factor causing heat exhaustion. Under strong radiation the sensation of heat pouring down on to the body makes men think the air is hot to extreme degrees. It often is up to 150 degrees for short periods but keep the exposed skin of face and hands out of the direct path of radiation.

Symptoms of heat exhaustion are irritability, depression, loss of energy, initiative and interest. Heat stress will also give the impression of air hunger. A man feels that he cannot breathe adequately. When these symptoms occur, a fire-fighter must recognize them and stand well back, away from the flames.

At a hot fire a man may sweat up to two quarts an hour from the 2½ million sweat glands of his body. This is his body's cooling mechanism in operation and for it to operate efficiently, the water content of the body must be maintained. On any hot day, when working hard, a man will sweat copiously — easily a quart an hour — and almost always, the tendency is not to drink this much water. So the body will be dehydrated and with this comes loss of mental alertness and general weakness. Therefore, drink as much as possible, taking a salt tablet (and sugar in tea if this is available). Tea is "top dog" as a fire drink. Alcohol dries the body out faster, slows reflexes and saps energy.

Good fire-fighters work together — they don't separate from their mates. A man on his own may be hit by falling limbs or be in some other trouble. Do not try to be too heroic. Only risk a life to save a life. Let haystacks, etc., burn if it is dangerous to approach them. Always obey orders and recognize the chain of command. The idea that the only worthwhile job is at the hottest spot is wrong. Fires in Victoria often run before a north wind and crews put to clearing a break on the east side may feel out of things, and that they are doing a lot of hard work for not much result. But, nearly always, the wind changes to a westerly, and if the east side is not properly treated, it is the new head and can be very lengthy — up to miles long. So, remember, clearing and controlling the side of a fire can be the important part of the whole operation.

Electrocution can come from power lines "livening" fences. Beware of this. Never be careless with loose ends of broken power cables and don't play a hose on them. Electricity can travel along the stream of water.

Stand clear of your mates, using axes and other tools. Watch out for the whip-out of starting cords on power pumps.

Fences are always danger spots. Don't try climbing through them until you are sure your equipment is not likely to catch on the wires. Make sure fences are not "live." It will be noted that animals die at fences.

Running at fires, unless in emergency, is plain stupid. Watch out for fires starting behind you, and keep an eye on escape routes, dugouts, etc.

There is no one simple answer to the protection of fire crews any more than there is one simple answer to the prevention and suppression of bushfires.

General Rules for Volunteer Fire-fighters:

1. Maintain line, and keep each other within hailing distance.
2. Don't undertake any task for which you are not equipped.
3. Don't light fire breaks unless ordered to.
4. Keep alert, look up, look down, look around, look for your own Section Leader.
8. Keep your eye on escape routes and holes and dugouts.
6. Drink and eat as often as you can.
7. Stay alive! Don't risk life except to save life.
8. Remember! Fire runs quickly uphill — is slower downhill.
9. Do not injure your mates with hand tools such as axes, etc. Work at a safe distance apart, carry tools correctly.
10. If a man's clothes are on fire roll him on the ground and use your own shirt to smother the flames.
11. Don't drink from a knapsack as they are often used for spraying weeds.
12. Take two or three salt tablets when possible.
13. Don't drink alcohol whilst fighting a fire.

BUSHFIRE SENSE

by courtesy of Rural Research in C.S.I.R.O.

"Fire and people do in this agree
They both good servants, both ill masters be."

Lord Brooke

Each summer in dry Australia many people are in peril of bushfire. Some perish — often most tragically, because they had not exercised certain simple safety precautions that could have averted danger. Or had they known a survival drill and understood the principles behind it they may have saved themselves even though trapped by unfortunate accident in a hazardous situation.

During recent years several organizations, including the C.S.I.R.O., the Commonwealth Forestry and Timber Bureau, the Forests Commission of Victoria, and A.P.M. Forests Pty. Ltd., have set up research groups to study bushfires scientifically. Much of their work has been directed towards finding out how fires start, how to predict accurately when and where and under what conditions fires are most likely to occur. In addition, they have been interested in other basic questions such as the fireproofing of natural fuels. But they have also been concerned with devising aids for firefighting and with promoting the comfort, efficiency, safety and protection of the men who fight fires. Between them, these research workers, by drawing on their own findings, knowledge and the experience of practical fire control, officers and their leaders in other departments have been able to sift out the best and most essential advice so far available on survival and safety.

For Survival and Safety —

Dr. A. R. King of the C.S.I.R.O. Bushfire Research Section, has helped to compile the following advice, which has been compressed into simple guide rules that amateur and professional firefighters can commit to heart and build into an instinctive pattern of behaviour. The rules suggested here apply directly to forest fires, but most of them are also apt for grass fires.

For Survival: when flames have already cut off your escape route —

Panic seriously drains nervous and physical energy, and clouds your judgment. Shun it.

Run only when absolutely necessary.
Use any and every means that will shield you from the radiated heat. (This is a most important principle of survival and should be clearly understood. See below.)

Take refuge in dugouts, running streams and ponds, but reject elevated water tanks except as a last resort. (A person almost totally immersed in lukewarm water — 115 degrees F. — reaches a state of collapse after about only three minutes.)
Limit the breathing rate when smoke is dense and await the arrival of the usually frequent small pockets of fresh air before filling your lungs. The air nearest the ground is freshest and coolest.

Do not delay in front of flames when it is necessary to enter them in order to escape, but having covered exposed skin as best you can in the circumstances and having taken some quick deep breaths, move briskly through on to the burn. Choose the path that is least obstructed by dense growth, logs or uneven ground.
Don't enter flames that are more than about five feet high or that are tending to "crown out" (enter the tree tops) or that are more than about 30 feet deep, or when the undergrowth is very dense. (Most fatalities have occurred when men have attempted to go through such severe flame fronts.)

Light a back-burn, say 20 feet long, if trapped by a high wall of deep flames. Step on to the burned area.
Lie prone on the ground when circumstances are most dire and, having covered exposed skin as best you can and having secreted yourself on the barest piece of ground in a rut, behind a log or rocks, in a culvert, or if possible by burying yourself, stay put. You have a good chance if you don't panic.
Resist the temptation to run from an encircling fire front unless your chances of escape are quite clearly high. If you do flee, run downhill since fire moves fastest uphill and try to work your way to the edge and rear of the fire front.

For Safety: to avoid dangerous situations —

Wear wool, long trousers, sleeves rolled down, shirt buttoned at the neck. Aim at exposing as little skin as possible.
Carry a spare box of matches for back-burning.
Know and keep in mind the local topography — its paths, roads, creeks, clearings, etc.

Chart an escape route before entering the fire zone and arrange a withdrawal signal.
Plan ahead and use whatever experience you have to anticipate changes in the fire.

Avoid standing or working in dense vegetation near the fire zone.
Stay on the edges of the fire — never wander into unburnt country. Don't worry others by disappearing.

Avoid becoming isolated from your companions.
Be quick to seek first-aid and know which of your companions is best fitted to render it and his whereabouts.

Pre-arrange code signals; avoid unnecessary shouting, whistling, or horn-blowing which could confuse or alarm others.
Leave vehicles parked facing in the direction of the escape route, with room for others to pass and with windows and doors shut and the ignition key in place.

Don't bring vehicles drawing trailers too close to the fire zone.
Aim at keeping yourself in top physical condition by eating three square meals a day, getting your full quota of sleep, and while fighting a fire drinking even more than your thirst sensations prompt you to drink. If a perilous situation develops you will need all your resources of endurance to survive.

Don't work too hard: harbour your energy; you may need all your strength for a later emergency. Pause to recuperate as often as you need and remember that the hottest job is not always the most important and that heroic acts are rarely necessary. Running wastes your strength rapidly and may cause others to become apprehensive.

For Safety: to avoid mechanical accidents —

Sit when travelling on vehicles.
Remember your passengers when driving.
Keep windows wound up in smoke, switch on lights and blow the horn occasionally.
Avoid travelling on bulldozers.
Keep clear of others using tools and bear in mind those nearby.

Beware of overhead limbs when chopping.
Maintain your tools in top-class condition.
Practise using your tools so that you know their proper capacity.
Carry hand tools at the hip, not over the shoulder.
Beware of rolling logs and falling limbs and trees (especially when the wind is high).
Watch out for the "kick-back" of a felled tree.
Be especially alert when working on or near dead standing timber, particularly if burning. (Only green trees "talk.")
Avoid having to fell trees leaning on others or likely to fall against others.
Watch your step to avoid tripping.
Wear strong leather boots, never shoes.

Radiation: life and death —

In most bushfire tragedies the people are usually dead or nearly dead before the flames actually touch them. By laboratory and field measurement and from the study of case histories of people who have either lost their lives or saved them when encompassed by fire, it is now abundantly clear that the radiated heat is the main peril leading to exhaustion and collapse. Radiation causes heat stroke, which is essentially a state of utter exhaustion. Shielding yourself from radiation and desisting from any behaviour or activity such as fear, panic or flight that saps your strength are therefore vital. Many of the rules for safety and survival listed above are based on these considerations. Heat rays, like light rays, travel in straight lines and are greatly impeded by opaque materials such as clothing, wood, earth, stones and metal. Knowing this, certain "miraculous" escapes are explicable. One old man, for instance, finding himself surrounded by a raging fire, draped a blanket over himself and stood where he was till the flames had died down. His several comrades who took other measures all perished. On another occasion, a party with a bulldozer was trapped in a small clearing in a pine forest. The driver of the machine dug a shallow trench and pushed the earth back on top of the others. Then he also slid into the trench and covered himself with the loose earth; all survived. Another two people in another fire wound up the windows of their truck and hid under the dashboard. Although the cabin became intensely hot — its glass melted — they quit the vehicle only when the upholstery caught fire. By this time, the flames outside had abated and they were able to walk through them to the refuge of the burn.

In all these situations the people lived chiefly because, whether intentionally or otherwise, they succeeded in shielding themselves effectively from the radiation and avoided loading further stress on their bodies by panicking or by running wildly. Had there been too many people to crowd into the cabin of the truck the others could have crawled underneath where they would have been fairly well shielded and where the air would have been relativly cool. Similarly, if trapped in a house, one should close all windows and doors and stay inside. Abandon such places of concealment only when they are burning fiercely and conditions in the hideout are becoming unbearable. By this time, with any luck, the surrounding vegetation will be almost consumed and the flames dying down. You should then be able to

walk through them to life and safety on the burn. When the invidious choice must be made, it is better to choose the oven than the griller.

The value of clothing as a shield must not be overlooked. It should be worn so as to cover the body as completely as possible. Boiler suits are good and woollen material is much to be preferred. Besides conferring somewhat better protection against heat rays than cotton, it does not catch fire readily and will save many a nasty small burn caused by falling sparks. Some artificial-fibre cloths are not good shields and the melted remains can seriously contaminate burns. Broad-brimmed hats provide effective cover, though helmets give added safety against head injuries. Rubber soles on boots conduct heat, melt and burn. And even leather soles should not have hobnails, which have been known to brand their pattern on the wearer's foot.

It is a commendable habit to have a spare coat or blanket in the camp, for fire-fighting often continues through the night or after a cool change. It can also be used as a shield in an emergency if you have to walk through flames.

The importance of shielding is so crucial that the C.S.I.R.O. Bushfire Research Section has tried to develop a suitable reflective skin cream which fire-fighters can apply to the exposed parts of their bodies. The best devised to date succeeds in reflecting two-thirds of the radiant energy that would otherwise be absorbed by the skin. In practice, this means that a person whose skin has been covered with the cream can remain standing with comfort for an indefinite time at a distance of four feet from flames two to four feet high. Such heat on skin unprotected by the cream quickly causes unbearable pain and most people find that they have to back off within about half a minute. The A.P.M. Forests and the Forests Commission of Victoria's research groups have worked towards developing face-insulating visors and other novel fire-fighting aids such as fireproof overalls, gloves and respirators. These have been issued recently to some specialized crews, who will test them under practical conditions so that any faults can be discovered before they are made available for general issue.

Physical Fitness —

The effects of immoderate exertion and radiation go hand-in-hand. Both are a menace to safety and survival at fires. Anything that places additional stress on the body is to be avoided. Lack of sleep, for instance, impairs physical strength as well as mental acuity. Fire bosses, especially, so that they can think clearly and quickly, should take care to get sufficient sleep. If necessary they should take sleeping tablets and delegate authority to avoid having their rest periods interrupted. The usual attitude that leaders should be available at all times contributes to inefficiency and ignores an important aspect of safety.

Lack of water can impose another serious stress. A dehydrated man first becomes sluggish, irritable, impatient, muddle-headed, tired and sleepy. With further loss of body water he becomes nauseated, generally incapacitated and could finally die. During the arduous conditions of fire-fighting a man may lose up to three quarts of sweat an hour.

Unfortunately, the thirst sensation that follows is not sufficiently prolonged or urgent to prompt the partially dehydrated person to

drink enough to replace his loss of water. He should, therefore, get into the habit of drinking more than his natural thirst demands. Any kind of beverage may be taken, but if very cold can induce stomach cramps and prematurely slake the thirst. Fire-fighters should also eat well to keep up their strength. Good meals will keep up the salt supply to the body necessary to avoid nausea and cramps after hard work. If meals are missed or saltless ones, such as fruit, are eaten, salt tablets may be needed.

Smoke from the fires is debilitating and can cause temporary blindness. User-tests supervised by C.S.I.R.O., A.P.M. Forests and others have shown that ordinary airtight goggles afford good protection. When first donned the smoke in them may cause the eyes to smart for a minute or two until the irritants are removed by the tears. Fogging and smutting are more serious shortcomings. Fogging, however, can be avoided by applying the demisting agents now readily available commercially. Smutting of the lenses, that is, blotching with dust, ash, etc., can be a source of considerable annoyance to the overwrought fire-fighter. The trouble may be side-stepped by arranging for the eyes not to notice it rather than attempting to find some means of keeping the lenses clean. A matt black gauze mounted in front will do this.

It "obstructs" vision so much that spots of dirt and smudges become invisible by comparison. But because the obtruding gauze is of uniform shape and non-reflecting black, the eyes quickly accommodate and do not "see" it. In forgetting the gauze, the mind also forgets the smut.

The lungs can be partially protected by holding a wet handkerchief over the mouth and nose or by means of a cheap cotton-wool mask held against the face by elastic straps. The more elaborate masks, being heavy and nuisances to carry, are of limited usefulness.

The various measures suggested here for reducing stress on the body may seem to be of small importance in themselves. However, bushfire fighters often work long hours under very tough and trying conditions.

The cumulative effect of many relatively small stresses and irritations results in impaired mental alertness and work capacity. And one lapse into carelessness, whether in the use of tools or in deciding on a course of action, could jeopardize life.

Extract from C.F.A. Rural Fire Brigades' Manual:

THE WESTERLY CHANGE

On January 28, 1952, parts of the Southern Riverina of New South Wales and North-Eastern Victoria suffered some of the worst fires in the district's history. People in the Upper Murray still remember with horror the inferno which broke away from Ho brook, in New South Wales, to travel thirty miles in three hours. The fire crossed the Murray at the riverside town of Walwa to be driven a further seven miles into rugged mountains towards Cudgewa and Corryong.

The day dawned hot and threatening. Temperatures climbed to 107 degrees by midday, with wind velocities reaching 54 m.p.h. from the north and the relative humidity dropping as low as 12 per cent.

Fire-fighters in the Holbrook district were powerless to stem the outbreak which quickly spread out of control. In just three hours the undulating country between Holbrook and Walwa was devastated. When the fire lashed across the River Murray at Walwa, two lives were lost and homes were reduced to ashes in minutes. A desperate battle took place to save the centre of the town as women and children found safety in the shallow waters of the Murray. Rural fire brigades were called from many miles away—as far afield as Tallangatta, Tintaldra, Granya and Corryong, with valuable assistance also from the Army establishment at Bandiana.

By 4 p.m., the fire had steered its course of destruction through the open grasslands in the valley, from where it continued its southerly race into the forested mountains. On the Victorian side, the fire was now the shape of a giant hand, the palm representing the blackened grazing lands, with long fingers of fire pointing into valleys and ridges.

The Upper Murray Valley is a mixture of rich river flats, with varying depths of undulating grazing lands reaching back to forest edge. In places, precipitous mountains rise abruptly from the river bank and the open country widens out into the fertile valley of a tributary or into low grassed hills. The improved parts of the valley seldom reach a greater width than four miles on the Victorian side, having the river as a northern boundary, with wild expanses of rocky and scrub-covered hills to the south. These are Crown Lands carrying Murray Pine, stunted Eucalypt and a wide variety of miniature herbage. Deeper in are valuable tracts of larger timber. The hills rise as high as 2000 feet above the valley—facing north towards the sun with its evaporating influence during dry periods.

The district is sparsely settled, but carries heavy stock. Pasture improvement has been intense and the floor of unimproved lands also carries a prolific native grass which is highly inflammable. The main industries are dairying on the flats, and highly productive wool-growing and cattle-grazing in the adjoining hills. This scene illustrates the lesson to be learnt from nearly all summer fires in southern Australia —the Change in Wind Direction from the North to the West.

The weeks previous to January 28, 1952, had been dry. Below-average rainfall during November and December followed good spring rains which provided a bountiful growth of pasture. January rainfall had been negligible. The earth baked hard under the dry ground cover, crackling underfoot. All was in readiness for the fury of a fast fire, and January 28 provided the climatic conditions.

We have traced the pathway of the fire till late afternoon, when it lay over the countryside like a huge destructive hand. By now it was a three-mile width of blackened waste at Walwa, and it maintained this distance as brigades mopped up the edges towards the hills for a distance of four miles. Beyond this point it was burning deep into inaccessible scrub.

All outside communication was disrupted and P.M.G. linesmen worked hard to repair lines. None of the brigades was radio equipped.

At 4.30 p.m., a drop in the wind brought a respite to fire-fighters. This was a false omen which led many to believe the frightfulness of the inferno was finished. Groups of men were still working on the edges, whilst in the twelve square miles of scorched area others stood beside the charred remains of their homes or searched for separated families. Along the Upper Murray Valley towards Tintaldra and Towong, in the east, lay mile upon mile of dry, unburnt farmlands, clouded under a pall of smoke. Some of these people were returning home after assisting their neighbours. For many, there was worse to come, with the horror of a new holocaust at night.

At 5 p.m., came the change from the west. A hot, dry wind of gale force came charging broadside at the fire. The front was no longer a ragged three miles along the edge of the bush from where it would go temporarily out of harm's way into the hills, later to threaten settlements further south on the next "blow-up" day.

The fire front was now the whole eastern side of the burn, about seven miles south of the river into Victoria, and thirty miles north of the Murray into New South Wales. The west wind swept a million burning missiles from smouldering trees and stumps. The whole eastern front flared up. Twigs, leaves, bark and dead limbs were all thrown like invading infantry into the long expanse of dry fuel as the change drove the huge line of fire into the unburnt Upper Murray. The thin line of weary fire-fighters were powerless against this new onslaught, and the flames advanced through their ranks and swept all before them.

Twelve miles of the rich valley was laid waste in the following hours. Those who went home to gather the evening milk yield were beaten by the speed of this incendiary horror. Their herds were engulfed in smoke and flames. Next day, the surviving cattle were a heart-breaking sight, with tortured udders grotesquely swollen, most of them to have their misery ended by a rifle bullet. The fire devastated Tintaldra and went on to threaten Towong, before the cool moist air arrived from the Southern Ocean to succour the tortured country. In these evening hours, the change in wind caused more damage, and drove the fire over more than twice the area affected by the northerly trend during the seven daylight hours.

BUSHFIRE PROCEDURE FOR COMMUNICATIONS PERSONNEL ATTACHED TO A HEADQUARTERS BASE OR A FORWARD BASE

1. Plot on map fire front in area in which squads are working — information from squads, C.F.A., police.
2. Calculate path and speed of fire.
3. Warn squads of any buildings in path of fire.
4. Advise of possible escape routes if squads in path of fire.
5. Ascertain from map, terrain in appreciation of vehicles in the area.
6. Keep a continuous situation report in 15 or 30-minute logs for immediate reference by any officer.
7. Keep up-to-date list of treated casualties from rough reports from squads.
8. Keep up-to-date log of squads' hours of duty to prevent danger of over-tired men.
9. Treat any casualties who may call at headquarters or forward base post.
10. Establish a casualty holding centre as in the RAAMC if line of evacuation temporarily cut.
11. Relieve as operator on radio, and assist at headquarters generally.

ST. JOHN AMBULANCE BRIGADE
VICTORIA DISTRICT

CLIFF CLIMBING AND RESCUE

by Sergeant J. Leonard

INTRODUCTION

This version is intended as a revision of the previous edition and as such now supersedes it. This is a subject for which theoretical background counts for little. Do not be led to believe that a thorough knowledge of the contents of this publication is the only qualification for competence in cliff rescue. Here, more than anywhere else in rescue work, it is dependent on precision and a high degree of skill present in every man. Do not attempt to train in cliff rescue unless you are prepared to put in the necessary training sessions.

CLIFF CLIMBING AND RESCUE

This subject of cliff rescue can tend to become bogged down in technical details when in fact it can quite easily be broken down into clear-cut, definite sub-sections. I have omitted minor details which are matters for the individual squads to ascertain for themselves and instead concentrated on those factors which are vital for safe climbing and rescue on all types of cliff faces.

It is important that squad members are competent (and confident) climbers before they attempt the dangerous task of cliff rescue. No climb or rescue on a cliff is the same as any previous one — each differs according to a combination of factors such as weather, number of men available and condition of the cliff. For this reason it is necessary to be acquainted with as many of the techniques of climbing as possible and this can come only with experience.

Most people seem to be unaware of the dangers involved in cliff climbing even if it is only on moderately high cliffs. The slightest slip can mean death or serious injury to any number of people. It is ridiculous to imagine that this subject can be taken lightly. Any squad which decides to undertake cliff rescue training must be aware of the responsibilities which they are undertaking.

CLIMBING

(a) **Ascents**

(i) **Free Climb** — With this method the climber relies entirely on his ability to select safe hand and foot holds. As an extra safeguard he should be secured by a safety line tied under his armpits. During the climb he should remember —

— **to conserve energy** — the legs are better able to support the body's weight than the arms. Do not remain in a strained or uncomfortable position for any longer than is necessary.

— **to establish a rhythm** — the climb should be done smoothly and at a constant speed. Try and settle into a definite rhythm and avoid unnecessary stops or bursts of speed.

— **to keep off the knees** — a cloth-covered knee is a poor substitute for a rubber-soled boot. When holds are further apart it is very tempting to use the knees but try and resist it. It is wrong and dangerous. Kneeling also restricts one's reach.

— **to climb by triangle** — at any time at least three limbs should be in contact with the rock while the fourth moves to or tests a new hold.

— **to keep the hands low** — avoid reaching higher than eye level as it interferes with the co-ordination between the hand and the eye.

— **to point the toes in** — point the toes in towards the rock with the heels out and down.

— **to remain upright** — try and maintain a vertical position so that the body weight forces down into the cliff rather than towards the bottom.

— **to test all holds** — it hardly seems necessary to mention this but there are hundreds of people who have discovered that it is important to do so. Remember a falling body accelerates at the rate of 32 feet/second/second.

(ii) Rope-assisted Climb

A rope securely fastened at the top of the cliff is straddled by the climber. Grasping the rope with one arm straight out in front and the other bent he climbs hand over hand. Remember always to reach out in front with a straight arm.

(iii) Rope Haul

Haulers — at least four lined up beside the rope grasping it with both hands. They walk backwards holding on to the rope until the back man reaches a certain point. The back man then runs to the front and takes up his new position.

Climber — the rope is fastened with a bowline under the armpits. Leaning back at right angles to the cliff as the strain comes on the rope, the climber walks up the cliff face keeping the feet at a comfortable and balanced distance apart.

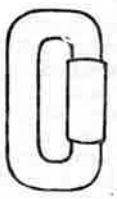
(b) Descents

The No. 1 Rescue Squad uses a technique which is a modification of the mountaineering technique known as "abseiling." Unless another method is proved by this squad to be superior, and this is doubtful, this method will be the only one to be used.

Equipment

(i) Karabiner — a metal snaplink with a spring clip opening and a threaded sleeve to prevent the clip from opening.

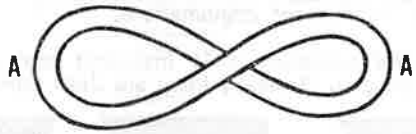
Open-without Sleeve



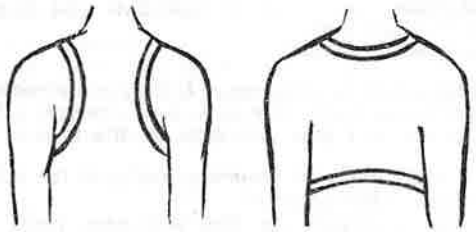
Closed-sleeve in position

(ii) Padded Shorts — one descent will convince anyone of the need for this piece of equipment. These should be both padded and comfortable so that an ideal material is felt of at least two thicknesses sewn with strong linen thread or twine.

(iii) Shoulder Loop — a length of 1½-inch rope, 11 feet long and spliced into a loop will generally suit most body types. The loop is crossed over and doubled so that it forms a circle half the size of the former loop. Both points A come together to form the smaller loop.



The loop is placed over the shoulders as shown in the diagram below and the two B points are clamped together with the karabiner. For ease of operation the opening of the karabiner should be on the right-hand side for a right-handed person and vice-versa.



FRONT BACK

(iv) Leather Gloves — a leather glove is worn on the right-hand to enable rapid stops to be executed more easily without the inconvenience of the rope burns.

Technique

The climber stands with his back to the cliff with the shoulder loop and karabiner in position. A 1½-inch rope is passed down through the karabiner and then between the legs. The rope is then brought up and across from the right hip to the left shoulder. It is passed out behind and held in the right hand behind and out from the body. The left hand **does not** hold on to the rope but is held in whichever position leads to maximum comfort and balance. The feet are kept about two feet apart throughout the descent. The climber backs over the edge using the right hand to control the speed of descent. Try and maintain a position of a right angle to the cliff face. There are two situations which are likely to occur.

Obstacles

If an obstacle is encountered the climber stops immediately above it and crouches so that he is close to the cliff. Then, letting the rope run freely through the hand, he thrusts out and back to land well below the obstacle. The shock of landing below the obstacle should be absorbed by flexion at the knees and ankles.

Sudden Slips

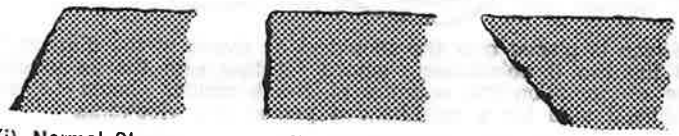
As the feet begin to slip grasp the rope firmly with the right hand and pull it sharply across the chest. The chin is tucked into the chest to protect the head and this position must be held until the normal position can be regained.

RESCUE

The type of rescue will depend on a number of different factors which may be present in different combinations.

(a) Cliff Shape

Except for special stretches it is important that the casualty be raised clear of the cliff. Basically there are three types of cliff shapes.



(i) Normal Slope this may vary in slope from very gentle to almost vertical.

(ii) Vertical Cliff

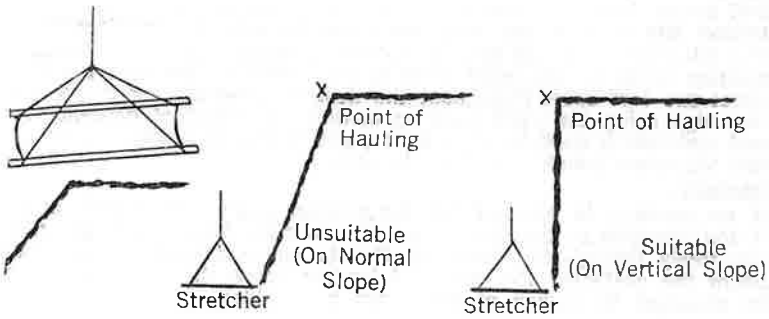
(iii) Undercut Cliff

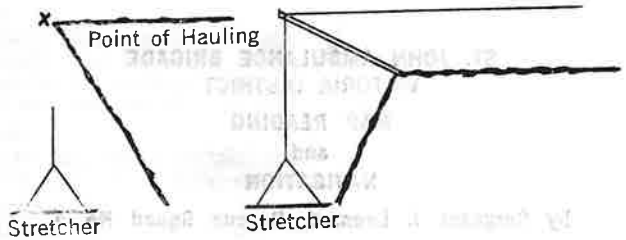
Each of these types has its own unique factors and associated problems. In order to overcome these problems it is necessary to understand the factors involved and their influence on the type of rescue to be effected.

There are two main types of stretcher available for cliff rescue:

1. Ordinary type stretcher.
2. Folding stretcher, e.g., Neil Robertson type.

The folding type is more suitable for raising a patient vertically while the former must be used when a casualty is to be raised in a horizontal poistion. The **ordinary-type stretcher** is therefore usually only suitable on a vertical or undercut cliff unless some type of boom apparatus is available. When raising a normal stretcher horizontally it is suspended thus. To enable the stretcher to be kept in the horizontal position the hauling rope must remain vertical. Therefore the point of hauling must be immediately above the centre of the stretcher.





Suitable
(On Undercut)

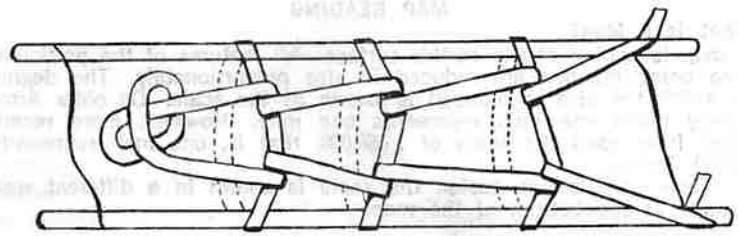
This stretcher can be used on a normal slope if a boom is available to place the point of hauling above the stretcher.

The folding-type stretcher is suitable for use on all types of cliff but is useful only when the patient may be raised vertically.

Whichever type of stretcher is used there must be provision made for steadying from below with ropes. As the welfare of the patient is the main consideration there should be some means of protecting him from falling stones and dirt. A thick covering of blanket and a helmet placed over the head help in this respect.

A device known as the manifold stretcher harness is available for securing a patient to the stretcher. This consists of a number of webbing straps but from a practical viewpoint it will usually be necessary to improvise.

A 40-foot length of 1½-inch rope can be used to lash a patient. A clove hitch is tied around one of the handles at the head of the stretcher and then three half hitches around the stretcher and the patient. These three half hitches should be placed so that they do not interfere with injuries although they should be distributed as evenly as possible along the length of the body. A round turn around the feet is followed by three half hitches applied to those already formed on the opposite side of the casualty's body.



ST. JOHN AMBULANCE BRIGADE
VICTORIA DISTRICT

MAP READING and NAVIGATION

by Sergeant J. Leonard, Rescue Squad No. 1

RULES FOR HIKERS

Although this is not directly concerned with map and compass work, I have included here a few commonsense rules to observe when you are out on foot which will make your job easier and safer.

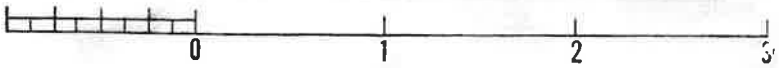
1. **Be properly equipped** —
   (a) Maps — be familiar with all types.
   (b) Protractor — square "Douglas" type is best.
   (c) Compass — as many as possible to each group.
   (d) Clothing — adequate and comfortable.
   (e) Head covering.
   (f) Small pad.
   (g) Pen and pencil.
2. **Check beforehand** —
   (a) Destination and plans.
   (b) Weather forecasts.
   (c) Location of water.
   (d) Tracks and roads.
   (e) Terrain and vegetation.
   (f) Special features of area.
3. **Avoid houses**
   — Skirt around cattle.
   — keep to fences.
4. **Stay together**
   — Always maintain contact.
5. **Skirt around hills**
   — Avoid unnecessary climbing.
6. **Avoid rivers and creeks**
   — vegetation always thicker here.

MAP READING

What is a Map?

A map is a plan of the earth's surface. All features of the particular area being mapped are reduced in size proportionately. The degree to which the size is reduced is known as the scale. On older Army survey maps one inch represents one mile. However, more recent maps have used the scale of 1 : 50,000, that is, one inch represents 50,000 inches.

To make calculations easier, the scale is shown in a different way, usually at the bottom of the map.



What to look for on a Map:

1. **Age:**
   — Maps alter greatly with age.
   — Roads may no longer exist.
   — Settlement patterns alter.
   — Rivers may be drained or diverted.
2. **Scale:**
   — Don't assume a certain scale.
   — Should be first thing checked.
3. **Reliability:**
   — Authority compiling map.
   — Reliability shown on Army maps.
4. **Symbols:**
   — Also known as key.
   — Aid to types of roads, tracks.
   — Show buildings, fences, landforms.
5. **Magnetic Variation:**
   — To be explained later.
6. **Direction of North:**
   — Not always towards top.
   — People draw as they know area.
7. **Method of Indicating Height:**
   (a) **Contour lines** — lines which join points of the same height above sea level. In Victoria sea level is regarded as low water mark at Williamstown. Thus, any point selected along the 150 feet contour would be 150 feet above sea level.
   (b) **Hill shading** — hill and mountain areas are shown in a contrasting colour to that of flat areas.
   (c) **Layer tinting** — a different colour is used for each individual height range, e.g., all country between 1000 feet and 2000 feet would be a different colour to that between 2000 feet and 3000 feet.

Contour Lines:

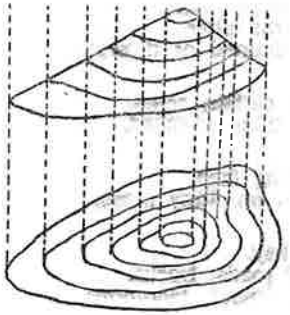
These are generally marked in brown on Army maps and are shown each 50 feet although this may vary and is shown on each map as the contour interval.

Number 1

Number 1

The contour lines are the same distance apart and circular on each side. The only hill which is circular at the base and has an even slope is a cone-shaped hill which is shown produced diagrammatically above the contour map.

Number 2



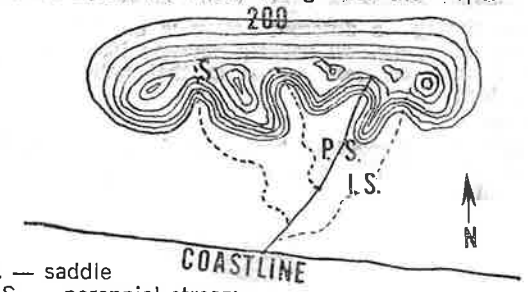
Number 2

On this contour map the lines are closer together on the eastern and south-eastern sides which suggests that these sides are the steepest.

The lines on the western side are wider apart and indicate a much gentler slope. The shape of a hill can easily be determined by the method used here. By producing vertical lines from the contour lines and then filling in at the correct distance apart the heights as shown on the diagram, the outline of the hill can then be drawn in.

Then as a **general rule** we can say—

The **closer** the contour lines the **steeper** the slope.
The **wider apart** the lines the **gentler** the slope.



S. — saddle
P.S. — perennial stream
I.S. — intermittent stream

Number 3

On this hill system there are five high points with lower levels (saddles) between them. Into this system extend four steep-sided river valleys. Only one of these streams flows continually, the others flowing only when the rainfall is sufficient to set them moving. During the drier months of the year these would be nothing more than a string of waterholes. However, the course of these streams can usually be seen by a line of trees on a plain or thicker vegetation in an already forested area.

The courses of the streams are straight in the steeper country, but begin to meander on the flatter land. They maintain their straight courses for some time on the flat, due to the force of the water, but eventually begin to describe a more erratic course.

There are no jagged peaks in this system, most of the high points being fairly extensive and elongated in shape. There are steep areas along the southern border and the sides of the river valleys with a much more gentle slope towards the north away from the sea. If this type of country was typical of the whole area it would be characterized by moderately high mountains parallel to the coast with steep slopes to the sea. A series of short streams would flow out of the mountains, across a narrow, flat coastal plain to the sea.

To Calculate a Gradient:

This is important in selecting the easiest way between two points or in establishing the ability of your vehicle to climb a certain hill.

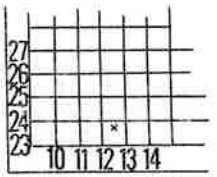
1. Measure the distance on the map between the two points and calculate the actual distance from the scale.
2. Calculate the height difference between the two points from the contour lines.

Let us assume that on a given hill the distance between the two ends of the hill on the map is 1000 yards and the height climbed is 100 feet.

By making a fraction $\frac{100 \text{ feet}}{1000 \text{ yards}}$ or $\frac{100}{3000}$ feet and cancelling it out, we arrive at a figure of $\frac{1}{30}$ which indicates a slope of 1 in 30 or 1 foot climbed for every 30 feet travelled horizontally.

Pinpointing a Position:

The map is divided into squares by lines placed vertically and horizontally known as grid lines.



To give a grid reference for the point marked by the centre of the cross, first read across from the left-hand side. You will see that the point is half-way between 12 and 13 or is at 12.5. Now read up from the bottom and you will see that it is three-quarters way between 23 and 24 or 23.7. Therefore, the six-figure grid reference for this position is 125237.

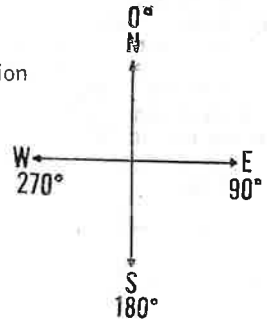
Remember always read ACROSS and then UP.

When directing a person to your position give him extra assistance by pointing out distinctive land features, such as an unusually shaped hill or a prominent tree. This will enable him to locate you far more easily.

Magnetic Variation:
Unfortunately Grid North which is indicated by the vertical grid lines does not always correspond to Magnetic North, the point to which all compasses are attracted. The difference in degrees between these two is known as the Magnetic Variation of the map and is shown thus: This indicates that the magnetic variation is 10 degrees east of Grid North, although this figure varies yearly and the current figure can be calculated from the yearly figure.

GN — Grid North
MN — Magnetic North
MV — Magnetic Variation
SP — Starting Point
D — Destination

To Obtain a Bearing:
(a) **Grid Bearing** —



Draw a light, thin pencil line between the starting point and the destination. Placing the centre of the protractor on the SP and lining up north with the grid lines, find the angle between grid north and the destination. This angle is known as the grid bearing.

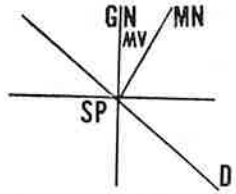
(b) **Magnetic Bearing** —
To march on a compass it is necessary to convert this figure to a magnetic bearing, that is, the angle between MN and D. If the magnetic variation is 10 degrees and the grid bearing is 150 degrees, the magnetic bearing is therefore 140 degrees. This is the bearing on which you march with the compass.

To March on a Bearing:
(a) Move away from any metallic objects, machinery or power lines and, holding the compass steady and level, find your direction of travel.
(b) Look along the line of travel and select a prominent object as far away as possible and march to it. Then repeat the process. A large and easily distinguishable hill or rock may be selected. A tree is not a reliable guide unless it stands on its own or is easily distinguished from others.

(c) Always select an object as distant as possible. If an error is made, and this is not impossible, the final result will be far more noticeable if the error is repeated several times rather than once or twice.

To March at Night or in Smoke:
Send one member of the group out in front with a torch and by relaying messages to him move him until he is on the correct bearing. His position can be determined by the flashing of the torch. Then march up to him and repeat the procedure. In thick bush or in dense smoke distances covered on each step will be much shorter.

To Obtain a Back Bearing:
It is of no use to arrive at a point to collect a casualty if you cannot return. To simplify this process, the original bearing is converted to a back bearing.
(a) If the original was an angle less than 180 degrees (magnetic) then you add 180 degrees to obtain the back bearing.



Original bearing = 90 degrees.

Back bearing (D to SP)
= 270 degrees (90 degrees + 180 degrees).

(b) If the original bearing was more than 180 degrees then subtract 180 to obtain a back bearing.

To Locate Position from Back Bearing:
(a) Select two or more visible landmarks which are identifiable with the map.
(b) Using the compass calculate the bearing of an object from your present position.
(c) Convert this to a back bearing by the above method.
(d) Convert this figure to a grid bearing. (Always draw a sketch to assist your calculations.)
(e) Using this figure, draw a line with the protractor on this angle from the object on the map.
(f) Repeat this procedure for other objects.
(g) The intersection of the lines drawn indicates your position.

VEHICLE NAVIGATION

Equipment:
— Pair dividers.
— Ruler — graduated in eighths and tenths.
— Pencil.
— Rubber.
— Protractor.
— Visible and accurate mileage meter.
— Light for night work.
— Map board at least 2 feet x 1½ feet.
— Message pads.

Navigating:

The navigator should be seated behind the driver to avoid possible distractions and screened from him to prevent interference at night.

An observer should be seated in the front seat where he can see the mileage meter.

(a) At the beginning of the trip the exact mileage should be passed on to the navigator.

(b) Using the dividers, he measures the exact distance to be travelled before the first turn.

(c) On a message pad he writes for instance "Turn left at 8642.8." Unless on a long trip only the last three figures and the tenths need be noted. It is a great help if a little extra information such as the approach of a bad corner or a narrow bridge can be also passed on.

(d) It is then the observer's job to watch the meter and advise the driver of his next turn.

(e) The same procedure is then repeated for the next leg. All messages must be written to avoid possible mistakes.

(f) It is the navigator's responsibility to select the best and quickest possible route and to avoid hills which are beyond the vehicle's capabilities.

(g) The driver should have no other job other than driving. He should not have to be watching for turn-offs, nor should he have to estimate hill gradients.

Points to Remember:

The most important thing to remember when travelling, whether on foot or in a vehicle, is to be alert. Find out anything you possibly can about the area from the map and be alert to watch for possible mistakes.

If you do make an error, stop and carefully consider your immediate plans. Wandering around in the hope of finding the correct way is the most common cause of being lost.

Panic always restricts one's judgment. Never be ashamed to admit your plight and to sit down and discuss the situation. Five minutes of careful thought is worth five hours of wandering aimlessly.

ST. JOHN AMBULANCE BRIGADE
VICTORIA DISTRICT

TRAINING PROGRAMME
for
RESCUE SQUADS

by Sergeant J. Leonard

This programme assumes that the squad members have not recently engaged actively in any vigorous physical work. However, even those who consider themselves fit should undertake the entire course as the initial exercises contain lead-up stages to the more vigorous and advanced levels. Any member who has any doubts about his fitness should not begin without first receiving medical approval. No person can consider himself fit until he has passed not only an examination in rescue techniques, but also a fitness test.

The work is arranged into weeks and beside each exercise is given the number of repetitions to be done on the five days of the week on which the exercises are to be done. A suggested plan would be to exercise on Monday and Tuesday, Thursday, Friday and Saturday, with the other two days to rest. This is only an idea, and if anyone feels he can exercise on five consecutive days he should feel free to do so. The ideal time to do the exercises is either before having the evening meal or before retiring. **Do not** exercise when you get up in the morning. It is important that these exercises be done properly. Do not complete the prescribed number at the expense of correct form. Do not progress to the next chart until you can complete the previous one for five days a week.

Although these exercises are progressively graded they do become extremely difficult in the advanced stages. Therefore, resist all temptation to skip a week or two at the beginning.

Week 1:

(a) **Arm Swinging** — 10, 15, 20, 25, 30.
(Arms by sides, swing forwards, upwards to shoulder level. Swing back down to touch side and up again to side.)

(b) **Alternate Touch Toes** — 8, 10, 10, 12, 12 (each side).
(Legs about three feet apart, bend down to touch right ankle with left hand and vice-versa. Keep legs straight and if you cannot touch toes reach as far down leg as you can.)

(c) **High Kicking** — 4, 4, 5, 5, 6 (each leg).
(Hold arm straight out in front, waist high. Kick legs alternately to touch toes with hands. Do not lower hand. Body may be steadied with other hand on chair, etc.)

(d) **Skip Jumping** — 7, 9, 10, 12, 14.
(Bouncing lightly on toes, keep body and legs straight. Only movement is at ankles, land on toes. Jump about six inches off floor.)

(e) **Squat Thrust** — 5, 6, 7, 8, 9.
(Squat down, hands on floor outside feet. Jump legs back to push up position, arms straight, body rigid. Continue exercise without returning upright.)

Week 2:

(a) **Arm Swinging** — 8, 10, 12, 14, 16 (each direction).
(Circle both arms together forward and backward, trying to brush ears with arms straight.)

(b) **Alternate Touch Toes** — 14, 14, 14, 16, 16 (each side).

(c) **Squat Thrust** — 10, 10, 10, 11, 11.

(d) **Squat Jumps** — 4, 4, 5, 5, 5.
(Squat down, jump up to extended position in air 12 inches off floor and return to squat.)

(e) **Push-ups** — 3, 3, 4, 4, 4.
(Lying face down, arms bent, hands palm downwards under shoulders, push up to straight arms, keeping body rigid. Touch floor with chest when lowering.)

Week 3:

(a) **Arm Swinging** — 18, 18, 20, 20, 20 (previous description).

(b) **Alternate Touch Toes** — 16, 18, 20, 20, 22 (each side).

(c) **Squat Thrust** — 11, 12, 13 14, 15.

(d) **Sit-ups** — 4, 4, 4, 5, 5.
(Lying on back, knees bent, feet together, flat on floor. Arms folded on chest. Keeping feet on floor, sit up as far as you can.)

(e) **Double Knee Jumps** — 4, 4, 5, 5, 6.
(Stand, feet together, jump and bend knees until thighs parallel to floor. Land lightly on toes.)

(f) **Push-ups** — 4, 4, 5, 5, 6.

Week 4:

(a) **Trunk Bending** — 7, 8, 8, 9, 9.
(Standing feet astride, about three feet, bend down to touch floor with hands together (1) forward of line of feet (2) level with line of feet (3) behind line of feet. Return to upright after each set of three. Count one for each set of three.)

(b) **Double Knee Jumps** — 6, 6, 6, 7, 7.

(c) **Burpees** — 10, 10, 10, 12, 12.
(As for squat thrust, except return to standing between each repetition.)

(d) **Push-ups** — 6, 7, 7, 7, 8.

(e) **Side Support** — 4, 5, 6, 6, 7 (on each side).
(In side support position, supported by one hand, one foot on top of other. Raise top leg and arm together as far as you can.)

Week 5:

(a) **Burpees** — 12, 13, 14, 14, 15.

(b) **Push-ups** — 8, 8, 8, 9, 9.

(c) **Double Knee Jumps** — 4, 4, 5, 5, 5.
(Same except left knees to chest.)

(d) **Sit-ups** — 5, 6, 6, 6, 7.

(e) **Back Arch** —
(Front lying, hands clasped behind back. Lift head and chest and legs and feet simultaneously.)

Week 6:

(a) **Alternate Touch Toes** — 26, 28, 30, 32, 34.

(b) **Arm Swinging** — 20, 24, 28, 30, 32 (last description).

(c) **Squat Thrust** — 17, 17, 18, 18, 20.

(d) **V-Sit** — 5, 5, 6, 6, 6.
(Back lying, sit up to left body and legs off form at same time to form V-shape and touch toes. Lower slowly.)

(e) **Push-Ups** — 5, 5, 5, 6, 6.
(As you push up lift hands off floor to clap once. Land with arms straight and then repeat.)

Week 7:

(a) **Trunk Bending** — 12, 14, 16, 18, 20.

(b) **Squat Thrust** — 20, 21, 22, 23, 24.

(c) **Push-Ups** — 6, 7, 8, 9, 10 (last description).

(d) **Push-Up and Dip** — 5, 5, 6, 6, 8.
(As you push up bend body at waist upwards and then dip down and forward to slide nose along floor and then back up again.)

(e) **Trunk Circling** — 5, 5, 6, 6, 6 (in either direction).
(Stand feet astride, about three feet apart, hands on hips. Bend forward and then twist around to side and behind to circle back to front.)

Week 8:

(a) **Burpees** — 16, 16, 16, 18, 18.

(b) **Double Knee Jumps** — 6, 6, 8, 9, 10 (previous description).

(c) **Trunk Circling** — 7, 8, 9, 9, 10.

(d) **Push-Ups** — 10, 10, 11, 11, 11.

(e) **Side Support** — 8, 10, 12, 14, 16 (each side).

Week 9:

(a) **Push-Ups** — 8, 9, 10, 11, 12.
(Palms six inches forward of shoulders.)

(b) **Double Knee Jumps** — 10, 12, 12, 12, 13.

(c) **Russian Dance** — 6, 6, 7, 7, 8.
(Squat down with one leg stretched out in front. Jump to change feet around. Keep hands on hips. Try and maintain balance.)

(d) **Squat Thrust** — 25, 25, 26, 26, 26.

(e) **Single Leg Squat** — 3, 4, 4, 5, 5 (each leg).
(Swing one leg straight out in front, squat down on other. Keep straight leg off floor. A chair, etc., may be used to keep balance. Do not use chair to help rise.)

Week 10:

(a) **Russian Dance** — 8, 8, 9, 9, 9.

(b) **Alternate Touch Toes** — 40, 44, 48, 50, 52.

(c) **Push-Ups** — 10, 12, 13, 14, 15.
(Palms nine inches in front of shoulders.)

(d) **Push-Ups** — 10, 10, 10, 11, 11.

(e) **Side Support** — 16, 18, 18, 19, 20.

Week 11:

(a) **Push-Ups** — 12, 12, 13, 13, 13.
(Palms nine inches in front of shoulders.)

(b) **Double Knee Jumps** — 14, 15, 15, 16, 16.

(c) **Star Jumps** — 10, 12, 14, 16, 18.
(Jump and part legs and throw arms out and back to form star shape in air. Jump about 12 inches off ground.)

(d) **Russian Dance** — 10, 10, 11, 12, 13.

(e) **Sit-Ups** — 10, 11, 12, 14, 16.

Week 12:

(a) **Push-Ups** — 11, 11, 12, 12, 13.
(Feet resting on chair, etc., 12 inches high.)

(b) **Squat Jump** — 10, 12, 14, 16, 18.

(c) **Alternate Touch Toes** — 30, 40, 40, 50, 50, 50.

(d) **Sit-Ups** — 20, 20, 25, 25, 28.
(Legs straight.)

(e) **Burpees** — 20, 20, 20, 22, 22.

Week 13:

(a) **Rope Hanging** — 6, 7, 8, 8, 10 (seconds).
(Hanging arms bent from strong rope attached to garage beam, tree, branch, etc.)

(b) **Trunk Bending** — 10, 12, 13, 13, 14.

(c) **Trunk Circle** — 8, 8, 10, 10, 12.

(d) **Push-Ups** — 9, 9, 10, 10, 10.
(As above and clap hands once.)

(e) **Double Knee Jumps** — 18, 18, 18, 19, 19.

Week 14:

(a) **Cossack Jumps** — 12, 12, 14, 14, 14.
(Jump to touch toes with hands. Keep legs straight.)

(b) **Rope Hang** — 10, 12, 12, 14, 15 (seconds).

(c) **Boats** — 5, 5, 6, 6, 8 (each side).
(In V-sit position. Move legs to left, arms to right and vice-versa.)

(d) **Trunk Twisting** — 5, 5, 6, 6, 8 (each side).
(Front lying, hands clasped behind back. Sit up and twist head and shoulders to each side.)

(e) **Squat Jump** — 10, 10, 10, 12, 12.
(Squat jump but remain tucked throughout.)