

**Association des Anciens Combattants**  
**Services de Renseignement de France et des Pays Alliés**

**<< EX-INVISIBLES (A.C.S.R.) >>**

**Un manuel de survie**  
par Daniel TANT

Les militaires, anciens citoyens, n'ont pas toujours les éléments de survie dans la nature.

Pour eux, l'armée des U.S.A. a conçu ce livret de 74 pages, uniquement en anglais.

Tout est prévu pour survivre sur terre, en mer, sous les tropiques ou en arctique.

Des dessins représentent les animaux, les poissons et les plantes comestibles et les vénéneux, ceux qui peuvent être mangés.

S'y ajoutent d'autres renseignements comme les étoiles remarquables, etc...

Ci-après, quelques pages extraites de cette brochure.

Air Forces Manual No. 21W	
<b>ON LAND</b>	
Jungle-Desert-Arctic	
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## YOU HAVE EVERY CHANCE TO COME THROUGH SAFELY

*Keep your head—don't get panicky  
Save your energy—don't rush off wildly  
Stop—think things out—size up your situation  
Plan a sensible course of action  
Keep your courage up—help is on the way*

Your emergency aids and the instructions in this booklet will help you to:

1. Avoid hardships and stay well
2. Find food and water
3. Come out safely

The advice in this booklet is based on hundreds of experiences like the one you now face. It has helped many men come through safely. What they did, you too can do.

★

## HOW TO USE THIS BOOKLET

### On Land

Whether you come down in the jungle, the desert or the arctic, there are certain things you will have to do to get along on your own.

This booklet tells you *how to do such things*—how to make a fire, how to signal, how to find food and water, how to take care of yourself, how to travel—in the order in which you will most probably have to do them.

It tells you how to do these things in two ways—first by giving you the general methods and principles for doing them, and second, by telling you those special things you ought to know and do in the particular kind of country (jungle, desert or arctic) in which you find yourself.

To use this booklet in the best way, first read the general advice on the topic which concerns you—the topics are listed in the index on the front cover. Then, for the particular kind of country in which you have come down, read the special instructions that follow the general section.

### At Sea

For you who come down on the ocean, there is a separate section that deals with the special kinds of problems you will be facing. You will also want to read parts of the instructions for "On Land"—such as the First Aid section—for additional advice.

## ON LAND

### IMMEDIATE ACTION

Stay away from the airplane until engines have cooled and the danger of fire has passed.

Check for injuries. Give first aid. Make injured men comfortable. Be especially careful when removing casualties from the airplane; this applies particularly to men with injured backs and fractures.

Relax—take stock of your situation. Calmly plan a sensible course of action. Work deliberately—don't overexert.

Examine surroundings. Look for landmarks. Try to locate your landing site from flight data.

Try for radio contact as soon as possible. Try to keep engine in working order to generate power.

Get signaling equipment ready for instant use.

Prepare shelter to protect yourself from rain, hot sun, cold or insects.

Check emergency equipment and supplies—see what you have to live with.

Ration food and water immediately.

Start a logbook for future reference.

Stay with airplane until help arrives or until you've made proper preparations for travel, unless you definitely know you are within easy walking distance of habitation, or if you have come down in enemy territory. (See *Decision* p. 9.)

If the airplane is flyable, moor it properly and service.

If you've bailed out, try to make your way to the crashed airplane before nightfall (or make temporary camp overnight before going on) if you know where it is and can reach it easily. It will provide many items which will help you get along. More important—it's easier for rescuers to spot the wreck from the air than to see a single person on the ground.

Cheerfulness, a determination to live and common sense are just as important as food and water.

**IMPORTANT**—If you are forced down in enemy-held territory, abandon the airplane without delay. This applies especially in Japanese-held territory where the natives may be unfriendly and Japanese patrols are numerous. Burn all classified papers, smash and burn secret instruments, burn the airplane and travel out immediately.

### Special Instructions:

#### Jungle

Take shelter from rain, sun and insects.



Malaria-carrying mosquitoes and other insect pests are the immediate dangers of the jungle—protect yourself against bites.

In dense jungle, don't leave landing site without carefully blazing or marking your route.

#### Desert

Lack of water will be your biggest problem. Keep your head and the back of your neck covered and get into shade right away to reduce sweating and loss of body water.

Don't drink any water the first 24 hours—any water you drink later on will be used more economically.

#### Arctic

In winter, exposure to cold will be your biggest problem—avoid frostbite. Don't overexert—sweating is dangerous because it leads to freezing. Remove unnecessary clothing when working; replace it when you stop—don't get chilled. Keep snow out of your boots. *Above all, keep your hands and feet dry.*

Collect wood, gasoline, oil or heather for fuel. Build a fire at safe distance from airplane and get under shelter (see pp. 13, 15).

If airplane is flyable: drain oil, insulate wheels from ice with boughs or canvas, anchor airplane securely, leave brakes off.

If down in a glacier area, be on your guard against falling into crevasses when reconnoitering.

In summer, protect yourself against insects.

## FIRST AID

The most likely injuries are cuts and bruises, fractures, concussion of the brain, internal injuries and burns. Keep injured men lying down; handle carefully if fractures or internal injuries are suspected. Watch for symptoms of shock.

**How to stop bleeding:** Place sterile pad directly on wound and apply pressure by hand or by bandaging firmly.

Elevate limb if bleeding does not stop.

Use tourniquet only if limbs are badly crushed or bleeding will not stop by pressure bandage method. Place tourniquet between injury and heart; release every 15 to 20 minutes for a few seconds. As soon as bleeding stops, loosen the tourniquet but keep it in place for use again if necessary.

**How to treat if breathing has stopped:** Apply artificial respiration at once. Be sure victim's tongue is pulled forward.

Look for head injuries and fractured skull (shows unequal pupils, bleeding from ears or into skin around eyes); if head is injured try to keep it raised. Keep patient warm and dry. Handle gently. Don't give morphine to men with head injuries.

Keep up artificial respiration at normal rate until breathing is restored or man is unquestionably dead (listen for heartbeat with ear against victim's bare chest). Keep patient quiet when breathing starts. If you have oxygen, give it when breathing starts.

**Chest Wounds.** Open wounds of the chest through which air can be heard sucking should be covered with the large dressing. Dust with sulfanilamide crystals and apply dressing very tightly *when the patient exhales.*

**How to treat for shock:** Some shock is likely to be suffered by all personnel after an emergency landing. Men in shock may have pale, cold skin; they may sweat, breathe rapidly and have a weak pulse; they may be confused or unconscious. Sometimes none of these symptoms exists.

Lay victim down flat, with head low and feet raised.

Keep patient warm, but don't overheat; if he is conscious and not injured internally, give warm drinks; don't give alcohol.

If available, give oxygen.

If victim is also in severe pain from injury, give morphine injection (syrrette) according to directions on container.

Be reassuring and cheerful toward men in shock.

**How to treat fractures:** Handle injured men with care to avoid causing more injury.

Don't remove clothing from a fractured limb. If wound exists, cut away clothing and treat before splinting.

Improvise splints from pieces of equipment or from a tight roll of clothing; pad with soft materials.

Give morphine injection (syrrette) for pain.

Keep casualty lying quiet; don't move him.

For *sprains*—bandage and keep part at rest.

**How to prevent infection of wounds:** Cut away clothing necessary to get at a wound. Don't touch wound with fingers or dirty objects. Don't suck wound.

Sprinkle wound with sulfanilamide crystals.

Apply sterile dressing with firm pressure into wound; tie firmly but not tightly.

Keep wounded part at rest.

Use iodine only for minor wounds, not for serious injuries. Don't use iodine in the tropics.

**How to treat burns:** Don't open blisters. Don't touch burned part with fingers.

Cover freely with burn ointment and sulfanilamide crystals. Apply thick gauze pack; bandage firmly. Don't change bandage.

If pain is severe give morphine injection.

Keep burned part at rest.



### Special Instructions:

#### Jungle

Even the smallest scratch can quickly become dangerously infected in the tropics. Promptly treat *any* wound.

(For snakebite and fish poisoning treatment see p. 25.)

#### Desert

Treat *any* wound at once.

Exposure to desert heat is dangerous. It can cause three types of heat collapse:

**Heatstroke**—may come on suddenly, the face is red, skin is hot and dry; all sweating stops; there is severe headache; pulse is fast and strong; unconsciousness may result.

Treat victim by cooling him off. Loosen his clothing; lay him down flat, *in the shade*. Cool by saturating clothes with water and by fanning. *Don't give* whiskey, tea or coffee. If water for cooling isn't available, scoop out trench in sand, place man in bottom and rig sun shade, leaving air space for ventilation.

**Heat Exhaustion**—results from too much exposure to sun and too much sweating. Victim is first flushed, then pale, sweats heavily, has moist, cool skin, may become delirious or unconscious.

Treat by placing victim in shade, flat on back with head low. *Give him salt dissolved in water*—2 tablets to a canteen. Since he is cold, keep him wrapped up and give warm drinks if available.

**Heat Cramps**—the first warning of heat exhaustion usually is cramps in leg or belly muscles. Treat by massaging sore muscles gently; keep man resting; *give him salt dissolved in water*.

#### Arctic

Keep injured men as warm and dry as possible—put blankets and wraps *over and under body*. Place in sleeping bag if possible. Provide shelter, build a fire. Give warm food and liquids to conscious victims not internally injured. Don't give alcohol.

**Treatment for Frostbite.** Symptoms are: stiffness, white or grayish color of skin, loss of feeling.

DON'T rub. DON'T apply snow or ice. DON'T thaw in hot water or before a fire. Severe pain is a sign that warmth is being too quickly applied.

Thaw frozen parts of face or ears with warm hands. Thaw frozen hand under armpit. Thaw frozen feet against warm skin of companion or warm in your hands.

Apply sulfanilamide crystals to deeply frozen areas. Wrap in sterilized bandages and keep clean.

Don't open blisters which may result when part thaws and swells.

Keep frozen feet elevated and at rest as much as possible and no warmer than body temperature. Carry frozen hands and arms in sling.

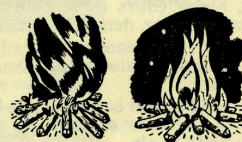
For more about frostbite and freezing; for treatment of snowblindness; and for treatment of carbon monoxide poisoning, see p. 26.

### SIGNALING

Get all your emergency signaling aids ready for immediate use. Rescuers are searching for you—be ready to help them find you. Use recognition code signals.

Your airplane radio or emergency radio is one of your best rescue aids. Try to make contact at once. Try to get a fix; if radio is serviceable you can transmit your position. When using airplane radio, save the battery; try to get an engine working to operate charging generator. Don't waste battery on long transmissions—follow briefing instructions. Try sending at night—reception is better and there's less traffic. Use frequencies known to be monitored. Gibson Girl antenna sent aloft can be used with liaison transmitter to produce a stronger signal.

Fire makes a good signal. At safe distances from the airplane, lay three fires at least 100 feet apart where they can be seen from the air. Have them ready to light when airplanes are heard or sighted. Keep some fire going all the time. Use smoke by day, bright flame by night. Add engine oil, rags soaked in oil or pieces of rubber (matting or electrical insulation) to make black smoke; add green leaves, moss or a little water to send up billows of white smoke. Keep plenty of spare fuel on hand.



FIRE MAKES A GOOD SIGNAL

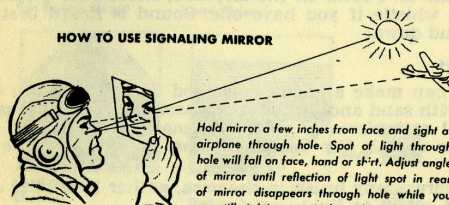
Smoke fire by day      Bright flame at night

Use emergency signaling aids such as flares and smoke grenades, as instructed. Keep them dry. Don't waste them—use only when friendly airplane is sighted or heard.

Practice signaling with mirror in kit. Mirror can be improvised also from ration tin by punching hole in center of lid. Even after you have been spotted, keep on signaling as long as airplane is in sight.

Signal with flashlight or blinker signaling light of emergency radio. If airplane's landing lights are intact and you can get an engine to run, remove lights and extend them for signaling. But don't waste battery—save it for the radio.

#### HOW TO USE SIGNALING MIRROR



Hold mirror a few inches from face and sight at airplane through hole. Spot of light through hole will fall on face, hand or shirt. Adjust angle of mirror until reflection of light spot in rear of mirror disappears through hole while you are still sighting on airplane through the hole.



Place or wave the yellow-and-blue cloth signal panel where it can be seen in the open. Spread out parachutes. Make pattern of orange-colored Mae Wests. Line up cowl panels from engine nacelles upside down on airplane wings or ground; polish the inside surfaces—they make good reflectors. Arrange your ground signals in big geometric patterns rather than at random—they'll attract more attention that way. The radio balloon or kite makes a good signal.

If you can climb a tall tree and hoist a large white or colored improvised flag on a pole lashed to the top—it makes a good signal.

Do everything you can to disturb the "natural" look of the ground. If you are down in grass and scrub lands, cut giant markers—an 8-12 foot wide circular path, 60-75 feet in diameter, is easily seen from the air. A trampled or burned grass pattern will show from the air.

When down in enemy territory, use identification signals as instructed in briefing.

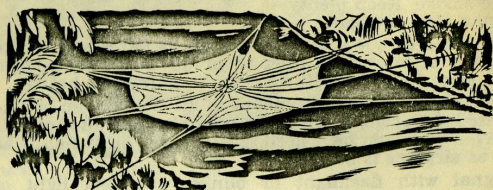
#### Special Instructions:

##### Jungle

Set up your fires and other signals in a natural clearing, along edges of streams, or try to make a clearing. Signals under dense jungle growth won't be seen.

When using emergency radio in thick jungle, try to find an open spot where you can get the antennas above the tree tops.

A good signal can be made by stretching your parachute across a narrow stream; tie shroud lines securely to trees on either bank.



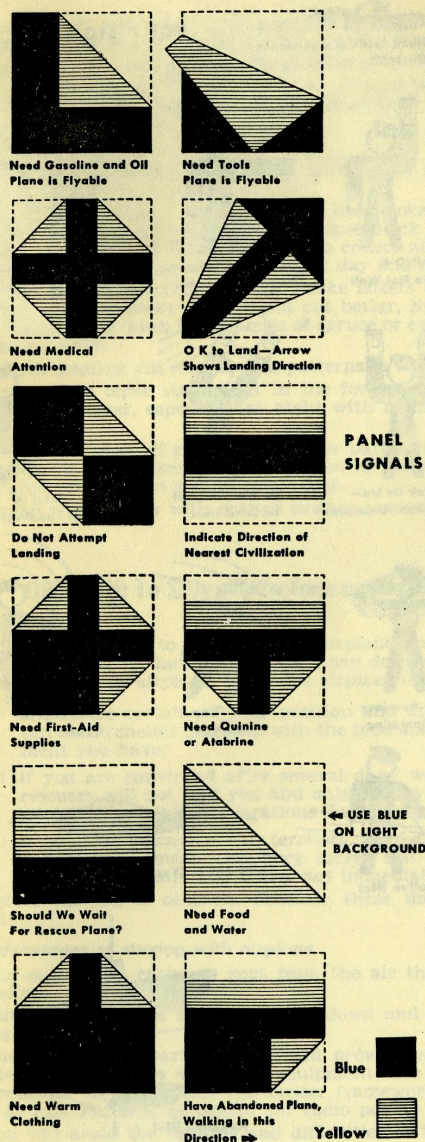
A parachute stretched above a stream makes a good jungle signal

Loud noises may sometimes attract the attention of unseen natives. Pound on the airplane, shoot your pistol or blow a whistle if you have one. Sound is heard best at dusk and dawn.

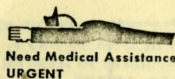
##### Desert

You can make a good improvised flare from a tin can filled with sand and soaked with gasoline. Light with care. Add oil and pieces of rubber to make dense smoke for daytime signal. Use gasoline alone for bright flame at night.

If there is any brush in the area, gather it in piles and have it ready to light.







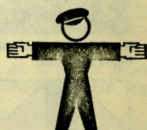
## BODY SIGNALS



All O K  
Do Not Wait



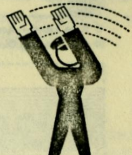
Can Proceed Shortly  
Wait If Practicable



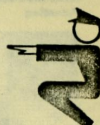
Need Mechanical Help  
or Parts—Long Delay



Pick Us Up—  
Plane Abandoned



Do Not Attempt  
To Land Here



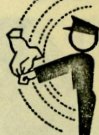
Land Here (Point in  
Direction of Landing)



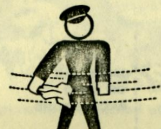
Our Receiver  
Is Operating



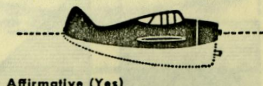
Use Drop  
Message



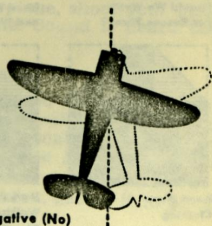
Affirmative  
(Yes)



Negative (No)



Affirmative (Yes)



Negative (No)

Smoke fires and smoke grenades are best for use in daytime. Flares and bright flames are hard to see.

The mirror is a very good desert signal; practice using it.

On arid islands, make sure your radio ground is in wet sand. In the desert, urinate to provide wet ground contact.

### Arctic

Keep snow and frost off airplane surfaces to make a sharp contrast.

Build three fires on prominent points. Use smoke fire by day—oil and pieces of rubber make a dense black smoke; at night, use a bright flame fire. Try to collect and keep enough fuel on hand to keep fires going day and night.

Tramp out giant S.O.S. in snow; make letters at least 100 feet high; to make them stand out better, line with dark boughs. Lay down large circles of spruce or evergreen boughs on snow.

In bush country, cut conspicuous patterns in vegetation.

A parachute tepee stands out in the forest or on the tundra in summer, especially at night with a fire going inside.

Use orange paint, if provided, to cover part of the airplane—paint in checkered pattern to cover largest possible area rather than a solid small spot.

Spread wing covers with orange surface uppermost.

### DECISION: To Stay at Airplane or Leave

The best advice is to stay with the airplane and await rescue. Most rescues have been made when downed crews remained with the airplane. Leave the airplane only:

- (1) if you are certain of your position and know you can reach shelter and help with the food and equipment you have;
- (2) if you are convinced after several days' wait that rescuers will not find you and only after you have made all possible preparations for travel;
- (3) if you come down in enemy territory. Burn all classified papers, smash and bury secret instruments, burn the airplane and travel out immediately.

Before making a decision, consider these important points:

#### Advantages of staying with airplane

The airplane is easier to spot from the air than men traveling.

Someone may have seen you come down and may be along to investigate.

The airplane or parts from it will provide you with shelter, signaling aids and other equipment (use cowling for reflector signals, tubing for shelter framework, gasoline and oil for fires, generator for radio power).

You will avoid the hazards and difficulties of travel.



improvised by placing a rope or pole between two trees or stakes and draping a parachute over it; make the corners fast with stones or pegs.

A fine shelter for drizzly weather and protection against insects is a tepee made from your parachute. In it you can cook, eat, sleep, dress and make signals—all without going outdoors. You will need a number of good poles, 12 to 14 feet long. Use 14 segments of the parachute—the method of construction is shown in the illustration. This shelter is worth building if you decide to stay in one spot for some time.

Avoid sleeping on the bare ground. Provide some sort of insulation under yourself—soft boughs are good. Pick a bed site on level well-drained ground free from rocks and stumps. If you have to sleep on bare ground, dig depressions for your hips and shoulders and try out the site before you set up your shelter or spread your bedding.

**In the winter.** Camp in timber if possible, to be near fuel. If you can't find timber, choose a spot protected from wind and drifting snow. Don't camp directly at the bases of slopes or cliffs where snow may drift heavily, or under ridges where overhanging snow may come down and bury you.

You will need shelter against the cold.

Don't live in the airplane—it will probably be too cold. Try to improvise a better-insulated shelter outdoors.

Prop airplane doors against a wing and bank the sides with snow; or build a walled windbreak or snow house by piling snowblocks up to the wing. Moor the airplane securely and guy wing from all sides against storms.

In timbered country, a good winter shelter is a lean-to. A 3-man type is shown in the illustration. Lay the covering boughs shingle-fashion, starting from the bottom; if you have a canvas, use it for the roof; close ends with fabric or boughs. Note the arrangement of the fire.

A quickly improvised temporary shelter for one or two men is a two-sided bough den. Bank sides with snow, leaves or moss.

Keep the front openings of all shelters crosswind. A windbreak of snow or ice-blocks set close to the shelter is helpful.

In timberless country, make a simple snow cave or burrow by digging into the side of a snowdrift and lining the hole with grass, brush or tarpaulin. If the snow isn't deep enough to support a roof, dig a trench in a drift and roof it with snowblocks, tarpaulin or other material supported on short poles.

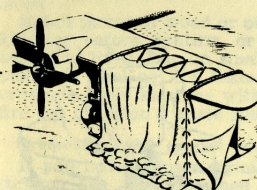
Reconnoiter for cabins and shelter houses; they are likely to be located along bigger streams, at river junctions, along blazed trails in thick tall timber and in the lee of hills.

*Prevent carbon monoxide poisoning by providing enough ventilation in enclosed shelters in which a fire is burning.*

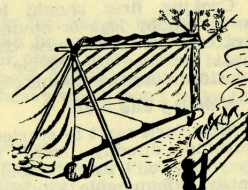
Don't sleep directly on the snow. Provide insulation under your sleeping bag or body. Stamp the snow down hard and lay a thick bough bed in shingle fashion, or use seat cushions, tarpaulins or even an inverted and inflated rubber life raft if available.

Keep sleeping bag clean, dry and fluffed up to give maximum warmth. To dry bag, turn it inside out, beat out frost and warm before fire—take care not to burn the bag. Wear only dry clothes to bed; keep them loose. Arrange a scarf around your head at night so you don't exhale directly into the sleeping bag.

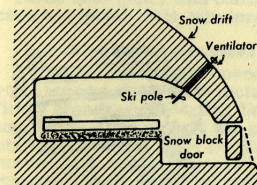
**In the mountains.** Don't make camp at the base of steep slopes or in areas where you run the risk of avalanches, floods, rockfalls and battering by winds. Camp well up on valley slopes, preferably near a creek—it's less cold than on the valley floor.



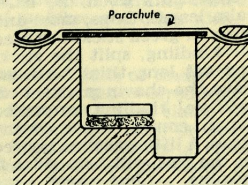
Improvised wing-cover shelter



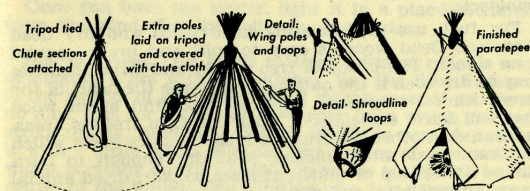
3-man lean-to



Snow cave shelter



Snow trench shelter



Construction of Paratepee

## FIREMAKING

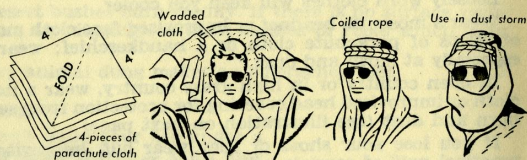
You will need fire for warmth, for keeping dry, for signaling, for cooking, or for purifying water by boiling. Follow the tried and proved advice below.

### Preparing fireplace

Prepare the location of your fire carefully. Clear away leaves, twigs, moss and dry grass so you don't start a grass- or forest-fire.



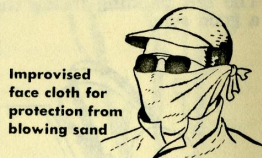
If you've lost your shoes or they wear out, make the sandals illustrated on page 21, but sew the toe shut.



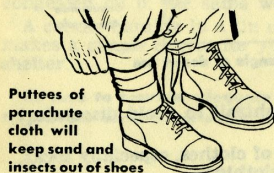
Making an Arab-type headdress



Improvised neckcloth for protection from the sun



Improvised face cloth for protection from blowing sand



Puttees of parachute cloth will keep sand and insects out of shoes



If you have no sun glasses, improvise cloth shield for eyes; cut narrow slits

Desert nights can be cold, especially in winter. If you travel, don't throw away any clothing—you'll need it. If you haven't heavy clothing, wrap yourself in your parachute on cold nights.

#### Arctic

It is important to wear clothing properly to keep warm and dry.

Insulation is the secret of warmth. Several thin layers of clothing worn loosely will keep you warmer than a single heavy layer. Your outer clothing should be wind-proof.

Avoid sweating—it's dangerous because it leads to freezing. When exerting yourself, cut down sweating by opening your clothes at neck and wrists and loosening at waist. If you're still warm, take off a layer or two. When you stop work put clothes on again to prevent chilling.

Wear clothing loosely. Tight fits cut off circulation and increase danger of freezing.

Don't get your boots too tight by wearing too many socks.

If you have no socks and your boots are big enough, stuff dry grass or kapok from airplane cushions around your feet—it will collect the frost and make fine insulation against cold.

Mukluks or moccasins with the proper socks and insoles are best for dry cold weather; shoepacs are best for wet weather.

If you lose your boots or if your socks are wet and you have no spares, improvise footgear by wrapping parachute cloth or wing cover cloth lined with dry grass or kapok around your feet.

Keep your clothing as dry as possible. Brush snow from clothes before you enter shelter or go near fire. Beat out frost before warming garments—dry them on rack before fire. Don't get boots too near fire. Dry socks thoroughly.

Wear one or two pairs of wool mittens inside a wind-proof shell. Try to do everything with mitts on. If you have to remove mitts, warm your hands inside your clothes—once they get too cold you're in trouble.

Wear sun glasses or improvise a pair to prevent snow-blindness (see p. 26).

Keep your clothing as clean as possible. Replace missing buttons and repair holes promptly.

In strong wind or extreme cold wrap yourself in your parachute and get behind shelter.

Wear a face cloth to cut off wind. Pin handkerchief or piece of cloth to parka hood or hat and let it hang loosely below level of eyes.

At night, arrange dry spare clothing loosely around your shoulders and hips—it will help keep you warm.



You can improvise sun goggles by cutting slits in a piece of wood



Protect your face from wind with a loose cloth pinned to your parka

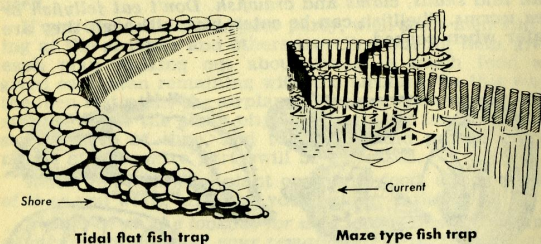
## HEALTH AND HAZARDS

Keeping well is especially important when you're stranded on your own. Your physical condition will have a lot to do with your coming out safely. Protection against heat and cold, and knowledge of how to find water and food are important to your health. But there are additional things you must and should do.

**Save your strength.** Avoid fatigue. Get enough sleep—even if you can't sleep at first, lie down, relax, loosen up. Stop worrying—learn to take it easy. If you're doing hard work or walking out, rest for ten minutes each hour.



or with stones so that the stream is blocked except for a narrow opening into a pen of shallow water. Wade in the stream, herding the fish into your trap. Catch or club them when they get into shallow water.



Fish spoil quickly in warm weather and spoiled fish can make you violently sick. Never eat fish with an unpleasant rotten odor, pale slimy gills, sunken eyes, flabby skin, or flesh which remains dented when pressed. Always clean fish immediately after catching. (For descriptions of poisonous and venomous fish, see p. 36.)

**Frogs and toads** are edible, but skin any you catch; some kinds have poison glands in the skin.

**Turtles** are all good to eat. You can catch them on land along banks of streams by watching where they go when they dive in—be careful of mouth and claws. If you see turtles on beaches, rush them and turn them on their backs. Turtle eggs buried on beaches can be located by digging where turtle tracks end; turtle tracks look like those of a miniature tank.

All **snakes** are good to eat, but take care to avoid bites. Cut off the head to get rid of the only source of poison. **Lizards** likewise are edible; catch them with a noose or club them with a quick stroke.

All **birds** are edible. Their eggs are edible too, if they are not rotten. Eat unspoiled eggs even if there is a live embryo inside them.

All **warm-blooded hairy animals (mammals)** are edible, but most of them are wary and hard to catch. Hunting requires some skill. The best method for a beginner is probably still-hunting. Find a place where animals pass, such as a trail, watering place or feeding ground. Hide nearby (pick a downwind spot so the animal can't smell you) and wait for game to come within range. Remain absolutely motionless. You can stalk an animal upwind by moving very slowly and noiselessly, keeping under cover as much as possible. Move only when the animal is feeding or looking the other way; freeze when he looks in your direction. Remember that large animals when wounded or with their young can be dangerous.

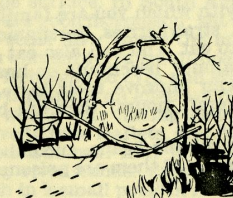
Game is most plentiful and easiest to find near water, open spots in a forest or along the edge of thickets. Many animals live in holes in the ground or in hollow trees. Poke a flexible stick into the hole, pull it up and look for hair on the end of it to determine if the hole is inhabited. Try to twist a forked stick into the animal's fur and pull him

out, or lay a noose over the hole to catch him when he sticks his head out. Animals in hollow trees can be smoked out by a fire built at the base of the tree. Be ready to club or shoot the animal as he comes out.

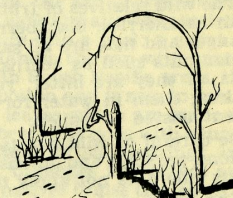
If you have a flashlight or can make a torch, hunt at night. Your light will pick up the animals' shining eyes. The game will be partially blinded, and you can get much closer than in the daytime. If you have no gun, try killing the animal with a club or a sharpened stick used as a spear.

**Animal Traps.** You may be able to catch many kinds of animals and birds with simple snares and deadfalls. The simplest snare is a slip-noose of fine wire with the end fixed into a tree, shrub or log and the loop suspended in a runway used by animals. A frequently used runway is indicated by fresh tracks and droppings. Choose a spot where the animal trail is narrow; arrange pickets or obstacles to force the animal to pass through the snare. Be sure the loop is large enough for the head to pass through, but not so large that the body will go through. Disturb natural surroundings as little as possible. Set snares in the evening and visit them early the next morning.

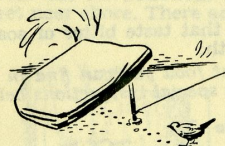
A better snare is a twitch-up type that will jerk the animal up into the air, kill him promptly and keep his



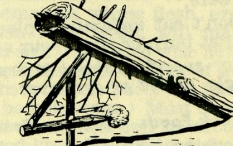
Simple snare



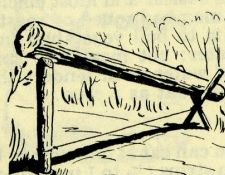
"Twitch-up" trigger snare



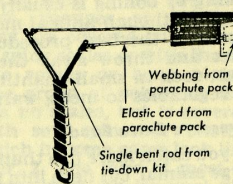
Simple deadfall



Deadfall with figure-4 trigger



Trip-wire deadfall for larger animals

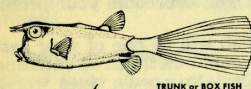


Improvised slingshot



teeth; this forms a powerful, white, turtle-like beak. 3. Most poisonous fish don't have a regular fish shape, but instead are odd-looking; many of them have a queer boxlike shape. The most common poisonous fish are the *puffers* or *globe fish*, *trunk* or *box fish*, *thorn* or *horn fish*, *file* and *trigger* fish.

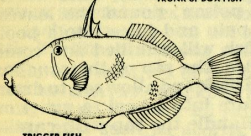
Always wear shoes while gathering shellfish or fishing in coral reefs or wading in shallow water. Be careful about cuts and scratches from coral, the sharp spines of fish and the slender spines of certain sea urchins. Wounds caused by these hazards may lead to serious infection. Another hazard around coral reefs is the venomous *lumpfish* or *stonefish*. It is often hard to see because its coloring blends with its surroundings. Its sting should be treated like snakebite. Don't handle large snails with cone-shaped shells; they can inflict poisonous bites.



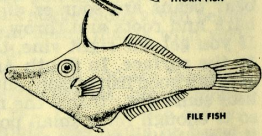
TRUNK or BOX FISH



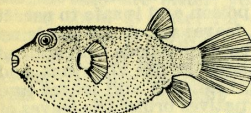
THORN FISH



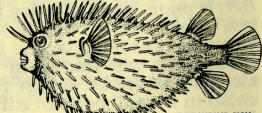
TRIGGER FISH



FILE FISH

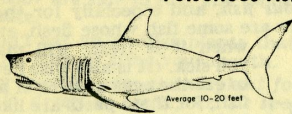


PUFFER FISH

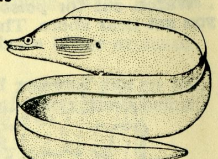


PORCUPINE FISH

#### POISONOUS FISHES



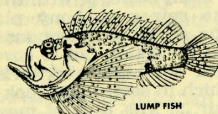
GREAT WHITE SHARK



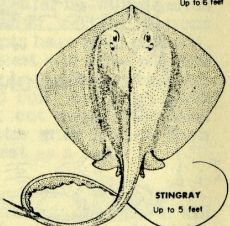
MORAY EEL



Average 3-4 feet  
GIANT BARRACUDA



Average 12 inches  
LUMP FISH



Up to 5 feet  
STINGRAY

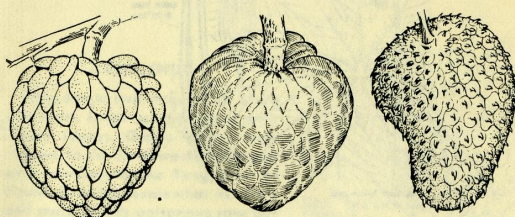
#### FEROCIOUS AND VENOMOUS FISHES

If you wade or swim in the sea, remember that dangerous *sharks* and *barracudas* often come close to shore, and that *stingrays* and *moray eels* can inflict painful wounds.

**PLANT FOOD.** There are many kinds of edible plants in the jungle. The most likely places to find them are along the margins of streams, swamps and open spots. In the wet forest about all you will find will be a few palms or ferns which yield vegetables. Occasionally you will find nuts or fruits on the ground under the trees.

**Food in Native Gardens.** In many parts of the tropics the local peoples live in small isolated villages and grow their food in nearby gardens or small clearings. Usually, if you find a garden there will be somebody living nearby who will feed you, or if the garden is some distance from the village, there will be a trail leading to it. You may, however, find an abandoned garden, or you may find yourself in hostile territory where you may want to take some food but avoid the owners. The common garden foods vary in different parts of the world, but some of the following usually will be present: coconut or other palms, banana, mango, durian, custard apple, papaya, guava, avocado, mammee, sapodilla, akee, sugar cane, pineapple or tropical almonds. The staff of life is usually rice, corn, plantain (cooking banana), breadfruit or one of the root crops, such as peanuts, sweet potatoes, yams, cassava or taro. Yams, cassava and taro are often closely related to the wild and poisonous varieties and such roots are unsafe to eat without cooking. Wild bananas are common in the forests of many parts of Malaysia and the Southwest Pacific. The fruit usually has very hard seeds which can be removed after the bananas are boiled. The fruit, akee, often found in South America, is dangerous if too ripe or too green.

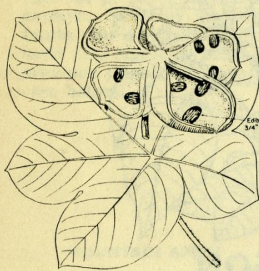
**Wild Plant Foods. Fruits.** The poisonous substances in plants may be in the whole plant but more often are concentrated in some part, usually the seeds or roots. Juicy or pulpy fruits, if they taste good are nearly always safe, but spit out the seeds. Large fruits are safer than small ones because the latter are often little more than a mass of small seeds.



#### CUSTARD APPLES

Edible. Fruits 2-6 inches long, soft and pulpy inside with shiny black or brown seeds. Grow on a small tree. Wild or cultivated in all tropical countries. Similar to the American pawpaw.



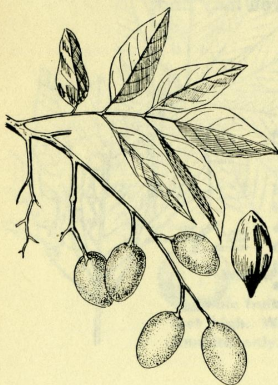
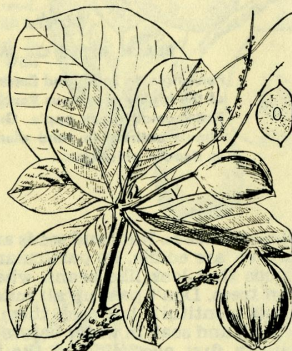


#### PANAMA NUT

Somewhat like chestnuts; grow on a large forest tree in tropical America but similar kinds occur also in the Southwest Pacific and Southern Asia. The nuts are edible raw or cooked. The leaves of some varieties are simple and not divided as shown.

#### INDIAN ALMOND

These grow on large trees in the Southwest Pacific and Africa. There are many wild varieties some of which are also cultivated.

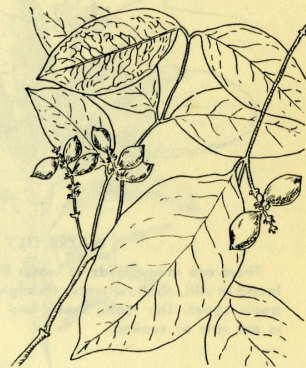


#### KANARI NUT

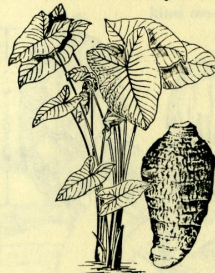
Fruit dark purple with a stony, three-angled nut. Good raw or cooked. Grows wild on tall trees in Southwest Pacific forests.

#### GNETUM

Small trees or woody vines; found widely in Southwest Pacific; also found in Africa. Trunk has raised rings from a few inches to a foot apart; twigs are jointed. Nuts are edible raw or cooked. Young leaves and flowers make a good green vegetable.



**Roots.** Many plants, particularly those growing in water or wet ground, have enlarged roots, tubers or bulbs. These may be your most common source of plant food in the jungle. Unfortunately, many of them are more or less poisonous. This is particularly true of lilies and onion-like bulbs which should never be eaten. (water lilies, however, are safe). The most important edible roots are the taros and some of the yams.

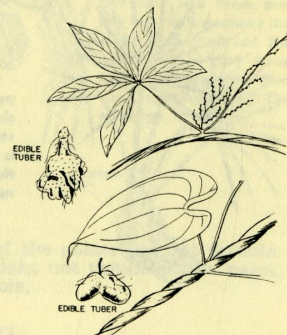


#### YAMS

Vines are common, wild and cultivated in Africa, Asia, Australia and the Pacific Islands. Found cultivated in America. Tubers may be as much as 8 feet long, but are usually 6 to 8 inches long. Cultivated kinds are edible when cooked, but eat only small quantities of wild ones at first as some are poisonous unless soaked for days.

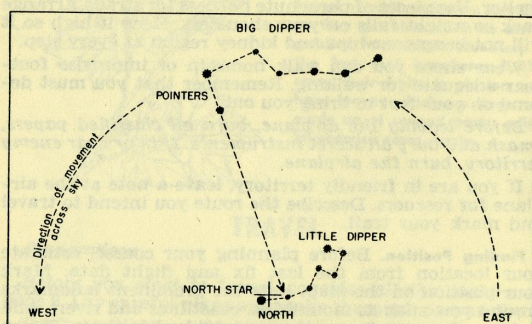
#### TARO

The safe kinds have an arrowhead-shaped leaf. Some grow small; some grow taller than a man's head. There are many kinds found commonly throughout the tropics, both cultivated and wild. All must be thoroughly cooked to be edible. Beware of plants that look similar but have a milky sap.

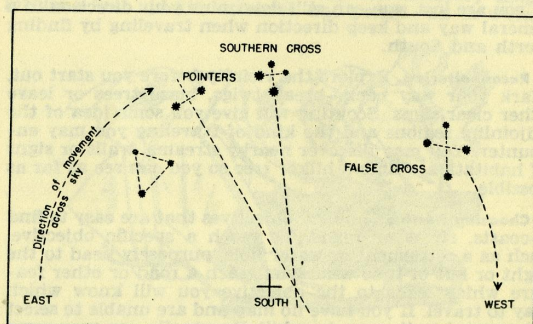




South. If these constellations can't be seen, watch the movements of the other stars. Stars that rise vertically from the horizon indicate east; those that set vertically indicate west.



Finding North from the stars



Finding South from the stars

**Keeping Track of Progress.** On level open ground the average rate of walking is 2.5 miles per hour. Keep track of the time you actually travel so you can estimate the distance covered each day. Mark this distance on your map. In rough country, your rate of progress will be cut considerably. Try to estimate rate and adjust. If possible to check against the time taken to reach landmarks you can identify on the map, you can arrive at your average rate of travel.

#### Travel Hints

Keep a sketch map of your travels, showing landmarks, distances covered and direction. It will help you keep on a direct course, show your progress and enable you to re-trace your trail.

Always pick the easiest and safest way, even if it is the longest. Save your strength by going around obstacles instead of fighting through or climbing over them. Don't spend an hour crashing through brush around which you can walk in ten minutes. Don't go straight up a steep slope—climb at a slant, zigzagging back and forth to save energy. Go around the edges of gullies and canyons—don't go down and climb up again out of them. Don't tackle a swamp or wet mud flat if you can walk around it.

Take it easy—keep up a steady pace. If you have to stop for rest often, you're going too fast and are wearing yourself out. You'll go farther and last longer with a steady reasonable pace. When traveling in a party, adjust the pace to the slowest man. Don't crowd—stay 8 to 10 feet apart on the trail.

If traveling in a party, *keep together*. The easiest way to get lost is to get separated from your party.

If you get lost, stop. Keep calm, and think back to where you went wrong. Return on the track by which you came until you recognize familiar ground. Then resume travel again.

A good way to follow a straight course is to choose two easily visible points (trees or other prominent objects) which are exactly on the line you want to follow and as far apart as possible; then walk, keeping the two points in line. Before reaching the first point, pick a third point in the same line ahead and repeat the method. When resting, face the direction in which you are traveling, or make a pointer of stones, twigs or scratches on the ground.

Streams and trails made by animals and human beings are the highways of the jungle and the arctic. Raft down streams. Walk the adjacent ridges—they are likely to have animal or human trails and may have numerous forks coming down to the stream. In hilly or mountainous country also, it will be easier to follow the ridges.

Listen for the noise of rivers or surf. Look for trails and shelter cabins.

Keep your eyes open for plant and animal food to supplement your rations.

In case of storm or fog, make camp and wait for good visibility and better conditions before traveling.

Always make camp early and before darkness, so that you can get comfortable while there is still light. For *shelter*, see p. 11. For *firemaking*, see p. 15. Organize camp work crews. Assign set tasks for each man; it will make your camping operations quicker and easier.

Cross streams with care. Carry a pole and test the bottom of the stream ahead so you won't step into a hole. The first man to cross swift streams should be roped so that other members of the party can pull him out if he's swept off his feet. Once across, he can make the rope fast on the other bank to help the rest of the men across.

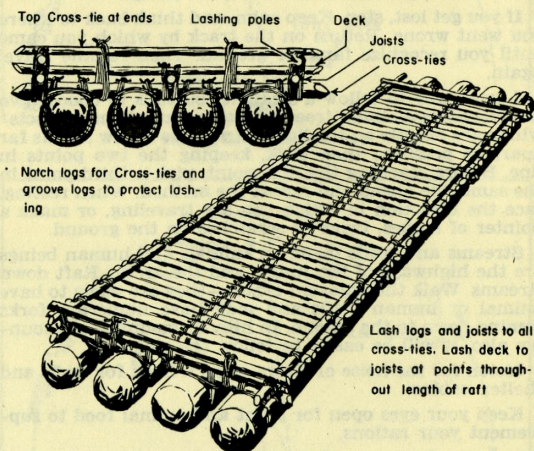
Avoid swamps and wet mud flats. If you come down in one, try to improvise "stepping stones" of poles or matted vegetation which you can lay down and pick up and lay down alternately as you go. If you have a life raft you may be able to make your way out through meandering water channels.



### River Travel

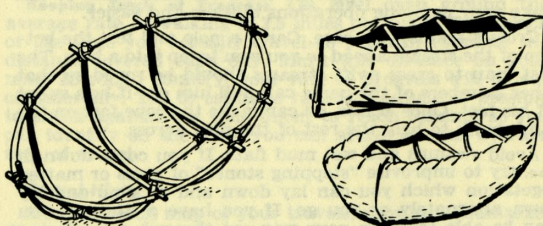
You will save strength, go faster and make rations last longer by rafting down a stream wherever you can.

If you have the rubber life raft from your plane and can get it to the stream use it for river travel. Otherwise, build a raft. Make it of sound, light dry wood; test wood by floating pieces in the water. In tall old jungle forest, most woods are too heavy for rafts. Good floater woods big enough for small- to medium-size rafts, grow in old clearings in the forest, along river banks and on sand and gravel bars in streams. Make the raft 5 to 7 feet wide, using poles 10 to 12 feet long and 6 to 8 inches in diameter. Skin the bark off the poles—they'll be more buoyant. To get enough buoyancy to support four men and equipment, it may be necessary to use more poles. Use wire from the plane, shroud lines or vines to hold logs together.



A log raft

A small serviceable boat may be improvised by wrapping a tarpaulin around an oval framework of saplings tied with parachute shroud lines or vines.



An improvised tarpaulin-covered boat

Rig up a cloth or brush shelter for protection from sun, cold or rain as required. Attach a 75-100 foot piece of wire, rope or vine to the raft for tying it up or for letting it down small rapids.

Use a forked pole to move the raft in shallow water; in deeper water use an improvised oar.

Travel rivers only when it's light. Keep near the shore so you can land in a hurry if necessary. If you are on the raft alone, don't go to sleep. Keep on the lookout for snags, rapids and waterfalls. You can either hear them at a distance or you may be able to see spray and mist. Don't try to shoot rapids or enter sheer-walled gorges—land at a safe distance above them and reconnoiter. Carry your gear around and either carry the raft or build another one below—look for a portage trail before you start off. In some places you may be able to "line" the raft through the rapids, letting it float down slowly while you walk along the bank, paying out rope. Take equipment off when letting raft down through rapids.

### Special Instructions:

#### Jungle

The most essential aids to travel in the jungle are a *machete* to help you cut your way, find food, make a raft; a *compass* for maintaining direction; *first aid kit* to keep you going in the face of fever and the risk of infection; *stout shoes* that will save your feet and enable you to walk out. Have at least these four items, and carry other equipment, if available, as recommended above.

You can determine North and South by the sun. On March 21 and September 23, the sun rises due east in the tropics. On June 22, the sun rises *north of east* as follows: 23° at the equator and at latitudes 10°N or S; 25° at latitudes 20°N or S, 27° at latitudes 30°N or S. On December 22 the sun rises *south of east* as follows: 23° at the equator and at latitudes 10°N or S; 25° at latitudes 20°N or S; 27° at latitudes 30°N or S. Estimate direction of rising sun at intermediate latitudes and dates from these figures.

Travel only when it's light. Avoid obstacles such as thickets and swamps. Don't try to crash through thick jungle; part it and pick your step. Don't climb over logs if you can walk around them. You not only will avoid injuries such as a sprained or broken ankle, bruises and scratches but will save your strength as well.

Find a trail and follow it. Go downhill until you find a stream—then follow the stream. Your best chance of finding villages and people is along trails, streams and on coasts.

A good place to pick up a trail is where two streams meet; here you will often find a crossing of trails which follow the adjoining ridges. There is almost always a trail crossing a low pass over a range of hills. On all trails, keep your eyes open for signs of natives.

At clearings or openings in the jungle you may not be able to see the trail. Cross the clearing and work along the edges until you pick up the track again among the trees.