

NAVAL SCIENCE

Life Saving at Sea

Emergency devices and equipment for life rafts now provided to save the lives of men adrift on open sea when their ship goes down.

By A. C. MONAHAN

See Front Cover

► SAVING sailors from sinking ships is a serious business with the Navy, Coast Guard, and the Maritime Commission. All their boats carry the most modern lifesaving equipment. Lifeboats and life rafts are ever ready, complete with every emergency device that weight and space will permit.

In addition to food and water there are navigation aids, signaling devices, medical aids, two-way radio kits, special clothing, and storm oil to sooth the waters in rough seas. Fishing tackle is included to supplement the food supply.

More than 40 separate items comprise the standard lifeboat equipment. Canvas hoods and side spray curtains make life more comfortable. Bailers, buckets and pumps get rid of water taken on during stormy weather. The boats and rafts are equipped with navigation charts, compasses, tables giving the daily positions of the moon, and sometimes simple apparatus to determine approximate latitude.

They carry distress signals: smoke signals for daylight hours and red lights for night. In addition to their radio sets they are supplied with reflecting mirrors to flash sunlight signals to the pilot of a searching airplane or to the lookout on a passing boat.

The smoke signals are cans which float on the water belching forth volumes of orange or reddish colored smoke visible

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WYOMING

Yes, even THIS summer you may fish in its mountain streams, ride horseback through its hills and canyons, find Indian relics and marine fossils in a region of great historical and geologic interest.

The Patons welcome a limited number of guests at their ranch in the Big Horn country. They offer plenty of ranch grown food, comfortable cabins and gentle horses. May they tell you more? Write:

Paton Ranch, Shell, Wyoming

for miles. The color makes it easily seen by flyers. (See front cover)

Signaling mirrors are made of stainless steel or other suitably polished metal. They have about 20 square inches of reflecting surface on each side and a small hole in the center.

Flashlights with which the lifeboats and rafts are equipped can be used for night signaling. The red distress signal is more valuable, however, as it can be seen from much greater distances. A watertight metal case that floats on the water contains 12 self-igniting red lights. Each one burns for two minutes, emitting a red light of over 500 candlepower.

The first aid and medical kits save many lives, for men from a war-crippled ship are apt to be suffering from wounds and burns, and often half-drowned as well.

The lifeboat contains 56 ounces of food per person for its rated carrying capacity; 14 ounces each of biscuit, pemmican, chocolate tablets and milk tablets. This 10-day ration can usually be eked out by patient use of the fishing tackle.

Water at sea is more important than food. The standard supply on Merchant Marine lifeboats is 10 quarts per person. Even in the tropics, a man can survive on less than 30 ounces of water a day—about two ounces less than a quart. The ten-quart supply should last from 10 to 12 days, and can often be replenished with rain water.

Fishing tackle helps in both the food and water problem. Fish is drink as well as food. If the fresh meat of the fish is cut up and squeezed, watery juices are extracted which can replace water in the human diet for a long time, if not indefinitely.

If no other way of squeezing is available, the juices may be extracted by chewing the raw flesh, swallowing the liquid and spitting out the solid matter. The watery juice is not salty; it is said to taste like the juice of raw oysters or clams. It had been tested and found safe.

In laboratory tests, men have lived 10 days without other liquids and remained in perfect condition. They gave every indication that they could live indefinitely

with it as their only source of water.

Equipment of life rafts is as similar to that on the lifeboat as storage space will permit. They carry rudders which may be attached and help in steering. They also have oars and demountable oarlocks. Some of them are provided with light telescopic metal masts which may be erected for sails.

The rafts are constructed of metal or wood. Within them are air-filled metal cylinders to keep them from sinking.

Rubber rafts are being experimented with. They have been used for some time by the air services to save the lives of crews forced to abandon their craft over water. Many stories have been told of lives saved by them, such as those of Dixon, Aldrich, Pastula, Gay, and Rickenbacker.

These rafts are carried deflated in the airplane. They can be very quickly blown up with carbon dioxide gas from a small container attached to them, by turning



LIFE - SAVING EQUIPMENT—
Emergency equipment furnished sailors adrift at sea is shown being inspected by Vice-Adm. R. R. Waesche, Coast Guard commandant. Men in the background are wearing light five-pound suits recently developed for those who must dive overboard in an emergency.

a single valve. The carbon dioxide is in liquid form under high pressure. One quart of it will fill two hogsheads when released, expanding approximately 450 times its compressed volume.

A small one-man rubber raft is often used by airmen. It is folded and attached to the body under the folded parachute. When the wearer reaches the water he pulls a string to bring to him the raft, or dinghy, as it is called, turns the valve and in ten seconds the raft is inflated. It will carry a weight of 400 pounds and will keep afloat indefinitely. It contains signal flares and rations.

An automatic radio distress signal may be sent from a lifeboat or dinghy by means of a new radio set. It is an Army development. It is a portable hand-generator radio transmitter with an antenna that can be held aloft by a box kite.

The set is designed to be used by a person with practically no knowledge of radio. When the crank is turned, power is generated and automatically the S O S distress-at-sea signal goes out on the air. The signal is strong enough to be picked up 200 miles away.

For sailors facing the necessity of going overboard, light, quickly-donned one-piece rubber overall suits are used. The one-piece suit covers the shoes and fastens tightly about the neck. An attached hood may be used to cover the head.

The suit weighs only a little over five pounds and can be rolled up and stuck in the pocket. It holds some air, which assists the wearer in keeping afloat. A small flashlight attached has a red lens so that floating men may be distinguished from floating rafts, which use white lights.

How to Find Latitude

A simple way in which men adrift on a lifeboat at sea can determine their latitude by using a piece of cardboard, a pin and a piece of string, has been developed by Sanford Cluett of Troy, N. Y.

The pin is stuck in the center of a nine-inch graduated circle on the cardboard. The device is suspended, weighted so that the 90-degree division on the circle follows a plumb line.

The sun's altitude can be derived from the position of the shadow of the pin. With the sun's altitude determined, the position of the lifeboat can be readily found with the aid of a table of solar declinations. If the men have a watch set on Greenwich time they also can figure their longitude.

All destructible equipment and sup-

plies on a lifeboat or life raft are packaged to protect them against air and moisture. Enclosed with them are full but simple instructions on the use of the materials provided. A leaflet of general suggestions is a part of the standard equipment. Hints on conduct and activities on the life-saving apparatus are included.

Shipwrecked sailors sometimes find uninhabited islands. They may be entirely unfamiliar with plant and animal life on them. Instructions furnished them tell how to find water, about a few of the

edible animals and plants, and suggest methods of protection against harmful animals and plants.

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The government has set a new price schedule for *mica* needed in war equipment so that present stockpiles will not be depleted.

Tiny, plump, shiny, black *flea-beetles*, early garden pests, make vegetable leaves look as if riddled with shot; a calcium arsenate spray is a good control.



Nine Young Men with "Eyes" Second to None



To the enemy command the star-marked bomber these nine young men will fly is a many-eyed creature of destruction. Its "eyes" of optical glass, fixed on the stars or sun, lead it straight to its objective. Then other optical "eyes" look down and ton upon ton of American-made TNT blossoms red in the dust of a shattered Axis dream. Still other "eyes" make the photographic record of its accomplishments to give lie to claims of "only slight damage" . . . to chart a path for others to follow.

Without the bomber's many-lensed "eyes"—what they all are and what they do is a military secret—without the instruments such as Bausch & Lomb produces, the powerful offensive blows of America's mighty bombing fleet would be impossible.

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