

p.m. Eastern War Time, on that particular night. The course to be followed could then be determined by directing the boat toward this star. Exactly 23 hours, 56 minutes later, Rigel would again be over Recife, and the course could be checked and determined for the following day. The path traveled would be a good approximation of a great circle, the shortest possible path to the destination.

All mathematical computations have been done in completing the information which Dr. Smiley includes in his chart of stars to be used in finding ports in the Atlantic and Pacific. Use of these charts is relatively simple for the uninitiated navigator.

Waterproof Leaflet

A leaflet printed on waterproof paper has recently been prepared for use by the Engineer Amphibian Command of the U. S. Army on emergency navigation by Dr. Bart J. Bok of the Harvard Astronomical Laboratory. This brief guide with tables is designed to assist the person whose navigational instruments have been damaged beyond repair and whose charts, almanacs and tables were swept out to sea. It is for use by those with some background in celestial navigation, but would be of great aid to anyone who suddenly finds himself forced to select a course.

An ingenious shadow marker is recommended to determine the sun's altitude. Even a beginner should be able to use this instrument designed by Sanford Cluett of Troy, New York, who incidentally invented the Sanforizing process for pre-shrinking fabrics. A pin is stuck in the center of a nine-inch graduated circle mounted on cardboard or plywood. This is suspended or weighted down so that the 90-degree division on the circle follows a plumb line. The sun's altitude can then be found by noting the position of the shadow of the pin on the graduated scale.

A table of the sun's declination is given in Dr. Bok's pamphlet so that when corrections have been made, the sailor can tell within 10 nautical miles how far he is north or south of the earth's equator.

In northern latitudes, measurement of the altitude of Polaris, the North Star, gives a good approximation for the latitude. For a more accurate value, a slight correction as listed in the pamphlet must be made since Polaris is one degree away from the true north celestial pole.

Apparent local noon may be found

by observing the sun shortly before and after noon. If the survivor notes on his watch the exact instant when the afternoon altitude of the sun equals the forenoon value, the time of local apparent noon will be half-way between the two. In this method the altitude in degrees, minutes and seconds does not have to be calculated. The time when the apparent sun was on the meridian differs from civil time (the time shown by a watch) by a small amount known as the equation of time. This ranges from zero to almost seventeen minutes. When allowances have been made for this variation, the position is determined quite accurately.

Working with a committee of the Coast Guard, Dr. Bok has just completed an enlarged and simplified version of the pamphlet on navigation in emergencies. Here the use of the pesky equation of time has been eliminated.

If the survivors are not fortunate enough to have a watch, longitude cannot be determined by celestial observations and must be guessed at. If a map is available, the position of a friendly island can be found and a rough north-south course steered until the desired parallel of latitude is reached. Then the navigator should turn west or east depending on the approximate direction of the island, and stay as nearly as possible on the parallel of latitude of the island until land is sighted. Dr. Bok warns that sailors should not attempt to steer directly for the island as when there is uncertainty about the longitude, they may miss the island and become hopelessly lost.

Charts for Airplane Pilots

Pilot charts for years have been considered as essential lifeboat equipment, but ones designed by the U. S. Hydrographic Office are just being furnished airplane pilots. If the shipwrecked person has some idea of where he is, these waterproof charts show how to take advantage of wind and current in reaching port.

The four charts, when wrapped in oil cloth, make a package measuring 9 by 4½ inches and 1¼ inches thick, which weighs about 1½ pounds. They show the north and south Atlantic, and north and south Pacific oceans. On one side of these 26 by 34 inch charts is given the region in winter (the January chart is used for this) and on the reverse, in summer (July chart). Arrows show the direction of the current and wind-roses every five degrees give the

relative frequency, force and direction of the wind.

Science News Letter, September 4, 1943

ENGINEERING

Multiple Parachute Launcher For Delivery of Supplies

► QUICKER and more efficient delivery of ammunition and supplies by parachute is provided by an invention of Capt. Harry Wilson, Air Force officer now located at Wright Field. His device is covered by patent No. 2,326,813, rights in which are assigned to the government, without payment of royalties.

Instead of heaving parachute-borne supply packs out one by one, in Capt. Wilson's system they are all shoved out the paratroopers' jumping door together. The parachute on the tail-end pack is jerked out by its static cord. As this parachute opens and the pack's rate of drop is checked, the next pack's static cord, attached to the first pack's lower end, is jerked in turn; and so on for each of the packs in the series. This saves time in launching the collection of all the equipment, and also insures that they will hit the ground closer together.

Science News Letter, September 4, 1943

WANTED!

FOR POST-WAR MARKETS

New ideas or patents relating to equipment, apparatus, or instruments applicable to research and control laboratory work, embracing—

PETROLEUM TECHNOLOGY
GAS TESTING
CLINIC, BACTERIOLOGICAL
BIOLOGY
PLASTICS, CERAMICS,
CEMENT
MATERIALS TESTING
SOILS
FOOD PROCESSING,
CEREAL CHEMISTRY
WATER AND SEWAGE
TESTING
RUBBER TECHNOLOGY
METALLURGY

also

ELECTRONIC AND OPTICAL
DEVICES, ETC.

Our client is an old, reputable manufacturer with a record of successful management and excellent financial standing—recognized design and engineering skill—skilled workmen—modern well-equipped shops—research and development laboratories—a technically trained staff—and complete sales representation throughout the world. All replies will be kept confidential. Address by mail only:

EARL C. CARLSON & ASSOCIATES
Dept. 56, 1 N. LaSalle Street,
Chicago 2, Ill.