Charts Of Sea, And Not Compass, Listed As Navigator's Important Instrument

All Instruments Are Interdependent In Navigating Ship, Says Harry Hall

The instruments used by navigators to enable them to determine the position of a ship at sea, or along a coast line, and to carry on a voyage from port to port, are so interdependent that it is hard to select the one outstanding aid to the successful accomplishment of such an adventure.

H. M. Hall

Personally, I should be inclined to select the chart as the most necessary single aid to navigation, for upon it must be plotted the result of all other acts of position-finding, and from it must be taken the courses and distances between ports. All other navigational calculations are made in order that this track may be made good. The chart is therefore basic in every navigational endeavor.

It is true that without the compass, the lead, the log, the sextant and the chronometer, or their present day substitutions, the charts, for all the good they would be, might as well be where mine are, thumb tacked to a wall in latitude 35 degrees 29 minutes N. and longitude 82 degress 59 minute W., 2721 feet above the level of salt water.

Without the chart the navigator would be as was Columbus, not knowing where he was going, but nevertheless, on his way. No one can help but bump into land, or ice, if they make enough knots in even an approximately one direction.

With all the improvements and added data found upon them, the charts of today are fundamentally the same as were the first hand drawn ones. They are a map of the sea, showing not only the extent of the waters themselves, but much that is hidden beneath the surface, the islands that rise above the surface, and the lands surrounded by the seas. Few other forms of maps present such a complete picture of every necessary object and condition as are those found upon navigational charts, and these aids are the results of years of marine surveys, constantly checked and kept up to date by reference reports published by the governments of the world. Any changes in buoys or lights, any new obstructions to channels, sunken wrecks, or other alterations in charts that might be a cause of ship damage, are published in the daily papers, or broadcast over marine radio.

There are several forms, or projections, upon which charts are drawn, each type being designed to meet a specific need of the mariner. The charts most generally used by navigators of the sea are drawn upon what is known as the Mercatar's projection. Roughly speaking, this projector assumes the imaginary theory that the earth is cylinderical. Therefore the meridians of longitude, which in a sphere came together at the poles, are opened out and appear on the chart as straight, parallel lines. This compels the stretching out in width of everything shown in high latitudes. In order that this east and west distortion may not effect the general outline of the charted sea too greatly the length is also stretched proportionately, so that although everything in the higher latitudes appears on too large a scale as compared with places in lower latitudes, the courses and distances measured on this chart projection are correct even though the courses are represented as straight lines, whereas on the curved surface of the earth the courses would also be curved. This is a very great advantage in course and position plotting.

In polar regions, because of this distortion, these charts are useless, because, for instance, you can not steer for the north pole on a chart with the meridians never coming together at any pole, but are perpetually prolonged parallel lines. Also bearings taken of distant objects are seldom quite correct when laid down as straight lines. But in spite of these high latitude draws back the Mercator's projection is the one best adapted for the average use of the navigators. In the polar region, where the Mercator's chart can not be used, those drawn the Gnononic projection are consulted. On this type of chart a straight line between any two points represents the arc of a great circle, and therefore the shortest distance between these two points. Gnomonic charts are also used in the form of navigation known as Great Circle Sailing.

Now let us look at a Mercator's chart and see just what a wealth of information one of them places at out command.

In the first place, unless otherwise stated the top of the chart is north, to the right is east, left is west and the bottom is south. The meridians are straight parallel lines extending north and south, true. The parallels of latitudes extend across the chart true east and west. In several advantageous positions on the chart a compass diagram, or "rose" is placed with the north, or zero degree point to the top, and a meridian of longitude forms the line from this north point to the south, or 180 degree point. The edge of this compass diagram is divided into 360 divisions or degrees, and numbered as on the face of watch, around to the right. On coastwise and harbor charts another diagram is placed inside of the degree one and is divided into the quarter points of the compass. The north end of this "rose" points to the magnetic north at that point. Dotted variation between the true and magnetic north at that point. Dottend irregular lines cross the chart showing lines of equal variation, together with the year the lines were established and the amount of annual increase or decrease in the variation for that line.

Scattered all over the chart are figures in black. Those represent the depth of water in fathoms. Close inshore the figures placed on a shaded section represent depths in feet. Along shore at depths up to 100 fathoms these depths figures are close together. Off Cape Hatteras the hundred fathom curve is about thirty-three miles out, and at forty-seven miles a depth of fifteen hundred fathoms is reached. Ten miles off the Cape there is no more than ten or twelve fathoms anywhere.

The type of the bottom is also marked at frequent intervals. For instance we find "gy.-S.-bk.-sp." This means that the bottom consists of gray sand with black specks in it. Putting an armed lead overboard we find 14 fathoms of water and the bottom sample is as above. Consulting the chart we find where these two features coinside, and we know very closely where our ship is.

All light ships are located on the chart with a description of the type of light it is, the duration of its flash, its color and how far it can be seen. Light houses are shown with descriptions of their lights. All buoys are located, and by their markings, or lights, or bells, or whistles, these can be identified by the navigator. All fog signals are described and located. Life saving stations are shown. The rate of tidal ebb and flow, and current directions and speed are given.. Every thing that can be of any aid to the mariner in locating his position off shore is printed on the chart.

Harbor charts are on a much larger scale and depths of water are shown in feet. Piers and docks are shown, and objects ashore from which ranges and bearings can be taken are identified. Tidal information and anchorage ground are given. All channel guides are shown; red buoys with even numbers are placed on the starboard side, and black buoys with odd number on the port side coming in from sea. Buoys with black and white perpendicular stripes are in mid-channel and must be passed close to. Buoys with red and black horizontal stripes show obstructions with a channel on each side.

There are many signs on charts to indicate abstructions, etc., as for instance, rocks just under the surface are indicated by a cross surrounded by a dotted circle, and rocks above water by a dotted circle with dots inside of it. All charts are dated and mean that they were correct on this date. As changes occur a notice of it is issued applying to chart number so and so of a given date.

The instruments used in consulting the chart are the parallel rule, the dividers and the course-protractor. The parallel rules are made of ebony or gutta-percha. They consist of two rules connected by cross-pieces of brass working on pivots so that the rules can be spread apart or drawn together, but always remain parallel to each other. They are used to determine the direction of courses.

The dividers are used to measure distances. Small charts show a scale of nautical miles from which to take off the distances. On larger charts use the latitude scales on the side, as a minute of latitude is always a nautical mile. The course protractor is used for shaping long courses and consists of a long, single rule upon which slides a movable compass card. By laying this rule to the course and moving the north point of the compass disk to coincide with a maridian, the angle of the course is shown at once.

Now we have the compass, the lead, the log and the chart, navigational tools sufficient to take us out of port, and start us on our voyage. Next week we will put them to use, take our departure by bearings, shape our course, start dead reckoning, check ourselves in a fog by lines of soundings and radio bearings, and get down to deep water navigation.

Makes $199.90 Profit From Ten-Cent Deal

Patrolman Fayette Cherry, of Mayfield, Ky., started trading when he had a 10-cent pocket knife, and ten weeks later he had an automobile he valued at $200.

Net profit claimed, $199.90.

There were at least 100 trades between the pocket knife and the car, Cherry said.

He doesn't remember them all, but among things for which he swapped were other knives, cash, radios and watches.

Cherry, now 67, has been trading seriously for 40 years.

"It's just my nature, I guess," he said, "I've never seen the time I couldn't get a trade out of something."

Cherry, for many years, operated a second hand furniture store at Kenwood, La., returning here five years ago—still in a swapping mood.

There's nothing unusual about the trade he has just completed, Cherry said.

Take, for example, that time 15 years ago, when he started with a rig, horse and buggy. Three months later, he said he owned a house and lot.

Another time, on a "trade day," Cherry swapped all day and found himself the possessor of a horse.

He had started out with—a halter.

His Alibi

"I'm surprised that you get such poor marks in spelling, my son."

"Well, you see, daddy, it isn't my fault. The teacher don't spell words the same as I do."