

As far as I know, there is no extant example of this simple, early log, but the Science Museum Collections include a similar log rather fancifully shaped like a fish. The log-chip is a triangular piece of wood of side about 5 in. long, weighted at its lower edge with a strip of lead and hinged at its apex to the body of the fish. (An illustration appears in this *Journal*, 8, 363.)

A line attached at one end to the bottom of the hinged flap and at its other end to the belly of the fish, prevents the flap from hinging beyond the vertical position. The exact arrangement of the log-line is conjectural, but there is a remnant of line securely fixed in the open mouth of the fish, and along the back of the fish is a device consisting of a small, pivoted catch working against a wooden leaf-spring.

I suggest that the stray-line was attached firmly in the mouth of the fish and looped over the pivoted catch. So long as the log-line ran freely, the log would remain stationary in the water with the fish heading away from the ship, but as soon as the line was pulled the loop in the stray line would slip the catch and the log could be hauled in, fish head first.

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## Visual Navigation in Enclosed Waters

from J. B. Mitchell

(*Master Mariner*)

Most shipmasters making a tortuous passage through a strait or among reefs and islands, after a long passage on one course in a vessel equipped only with magnetic compasses, are worried out of all proportion to the hazards of the manœuvre by reason of not knowing in all certainty what compass errors will pertain on widely different courses. Of course there is the Azimuth Record Book, but the last time similar courses were used could have been in the other hemisphere or under different conditions of trim, &c.

Given time, weather conditions and other suitable opportunity a prudent master will have conducted a swing to ascertain the errors before approaching the stretch of dangerous water. This may not be possible and, again, he knows in his mind that azimuths taken under these circumstances, with little time to waste, do not always conform to the later findings.

There is a very sure method of keeping the vessel under absolute control with regard to courses of extreme variance in rapid succession which I practise, and which, once you have acquired faith in the method, relieves you from a very great deal of strain induced by anxiety and allows a full measure of confidence. This is an old method, no doubt practised since the days of the great navigators, but I think it worth bringing to the notice of the seafarers of today because in these days of electronics and over-complication simple commonsense, such as Lecky taught, is apt to be considered too old fashioned to bother with. Hence the strain when you first take command. I am quite sure that this method was in common practice with Cook, Flinders and Tasman &c.

When there is little time to check errors, or the day is dull, and yet it is necessary to enter an involved channel, having approached with cross bearing or astronomical fixes in which you have every confidence, your proposed courses having been carefully considered and drawn in on the chart, use your compass

as a combination of pelorus and station pointer. From your alter-course position for the first leg, draw a fine line to the edge of the next salient point or lighthouse in sight ahead. Measure the enclosed angle quickly with parallel rules and compass rose and instruct your officer, stationed by the standard compass, to alter course until this salient point or light or other object bears the required number of degrees on the appropriate bow. If you do this quickly enough and the vessel alters course with full helm to start with, your ship's head by lubberline over the standard compass must be on the proper course. A quick comparison with the true course as laid down on the chart will give you the *present* compass error, though this may change as the vessel settles on the new course; careful conning and the use of all your instruments including vertical sextant angles of known heights around should take care of such errors as changing compass deviation and current set, windage, &c. Also when once enclosed a quick glance astern will often give you some object to turn directly away from and will be useful in detecting drift.

This method of comparative bearings corrects itself each leg and errors are not accumulative. Therefore it can be used again and again with complete confidence.

It will be easily seen that this method can also be applied directly to radar navigation when working through in thick weather by applying these principles directly to the viewer.

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## Navigation in the Days of Sail

*from* Captain A. R. Perry Shaw

At the turn of the century I served in two four-masted barques under three captains hailing respectively from Nova Scotia, Liverpool and Glasgow. All three were rather elderly and their practice of navigation did not exhaust the theory even then included in the syllabus for second mate. However, it may be interesting to recall their methods.

The captains personally had to supply, in addition to sextants and nautical tables, chronometers, charts, 'Pilots', patent logs and nautical almanacs. I doubt if they bothered about tide tables. These were all kept in the captains' bedrooms. Each of these captains rented and insured two chronometers. In port, if convenient, these went ashore to a chronometer dealer and just before sailing were brought on board, each with a card showing its maker's name and number with error of instrument and its daily rate. If at sea it was possible to get a longitude by bearings of the land and also longitude by sights, they would be checked and error and rate corrected. Of course in sail it was impossible to maintain an even temperature in the chronometer compartment. It was generally assumed that, owing to effect of change of temperature on the lubricating oil, a chronometer ran slower in cold weather and faster in hot. I don't know when they were cleaned. Perhaps if a ship did return to where the chronometers' owner had his place of business they might be cleaned before being issued to some other ship.

For financial reasons charts were few, generally covering large areas. 'Blue backs' were the favourites. I don't know if newest editions always replaced