

# Low-budget Hydrography

This month's theme led several readers to share some (mostly) happy memories with us; here are two of them.

## Scientific Beer Drinking

One typical example of low-cost hydrography is measuring ocean currents by means of drift bottles. This simple method has been used for many years. Already in 1787, French author and natural researcher Bernardin de Saint-Pierre invited mariners to release bottles into the sea containing notes with information for the finder on position and date of release of the bottle and address for return to sender. In 1885, on one of his first cruises onboard his oceanographic research vessel *Hirondelle*, Prince Albert I of Monaco used this method to study the Gulf Stream.

In 1964 to 1965 I participated with Hr. Ms. *Snellius* in the joint Netherlands/British oceanographic research programme "NAVADO". This project included a systematic, multidisciplinary survey of the North Atlantic Ocean. Our part consisted of ten parallel crossings of about three weeks each (lines 'Echo' to 'November'). As from line 'Hotel' it was decided to also include drift-bottle measurements. We used empty beer bottles, ballasted with sand and containing a letter in both English and French. The bottling team gradually reached professional standards: "In Casablanca the ship received a small hand-crown cork device from the Heineken Brewery, making it possible to seal the bottles in a perfect manner," (Commanding Officers Report, April 1965). The bottles were released at regular intervals, in batches of 24 or 48 each. The average number per line was about a thousand bottles.

Halfway through the project we stayed at the US Naval Base in Norfolk for maintenance and provisioning. We were tied up to our host ship, *USS Recovery*. The stores arrived by truck and were loaded with one of *Recovery's* cranes. US Navy ships are 'dry', so when load after load of Heineken was seen to be passing over *Recovery* into *Snellius* some jealous US sailor (I think) informed the local press. We told them that our Dutch sailors didn't really enjoy drinking all that beer but that they had to empty the bottles for the ocean-current programme. Our "Scientific Beer Drinking Programme" then made headlines in the local news media!

In total, some seven thousand bottles were released at 188 positions, while 184 returns came back from 56 release positions. The results, as analysed by the Netherlands Meteorological Institute, "appeared to be of interest since the release positions covered a large area of the North Atlantic, including such contrasting areas as the Sargasso Sea and that of the North Atlantic Current" (Hydrographic Newsletter 1972).

## Low-budget hydrographic surveying/low-budget tidal observations

While surveying on-board of the Dutch Survey Vessel *HNIMS Luymes* in the mid-sixties off the coast of former Dutch Surinam, position fixing was obtained by two range Decca. Consequently the ship anchored overnight, as the accuracy of the position during hours of darkness did not meet the criteria for the scale of the survey. However, for those involved in the actual survey work this did not imply that their work finished at sunset. The officers carried on for some more hours in the drawing room, sounding log-books were copied into the sounding registers, survey boats were being prepared for the next day etc.

Often, particularly when anchored in a river mouth, observations were made of tidal flow. In those days the tidal-flow (current) meters were mainly mechanical, consisting of a rev. counter attached to the ship's side and connected to a metal chain with at its bottom end a rod with a series of symmetrical divided ladles welded to it at right angles. The current caused the rod to turn and hence the rate of the tidal flow could be observed.

However, on a river like the Surinam River the outgoing tide carries lots of flotsam, varying from half-rotten tree trunks to ladies pants and, of course, this is always blocking or winding around the chain of the current meter. Therefore the Dutch surveyors used a much more simple way to observe the tide. The ship's carpenter was ordered to nail a series of small copper tacks into the foredeck as close as possible to the ships bow. Another series of copper tacks were nailed into the aft deck close to the stern. Personally overseen by the first lieutenant, the distances between the copper tacks were carefully measured using a long (calibrated!) tape measure.

The procedure was then as follows. During the periods the ship was at anchor the duty hand on deck (and there were plenty in those days) went to the bridge, recorded the ship's heading from the gyro and from there ran to the foredeck and dropped a small wooden stick (from a bag neatly prepared by the ship's carpenter, and all sticks of the same size of course) overboard. He then dropped to his knees to watch the stick pass the copper tacks, started the stopwatch and ran to the stern - trying desperately to stay ahead of the wooden stick and not to lose it in the dark - and stopped the stopwatch when the wooden stick passed the copper tacks on the aft deck.

The time interval was then later used to calculate the rate of the tidal flow at the time of observation. It often happened that the wooden stick got lost in the darkness, so the observation had to be repeated. But it was cheap, and certainly kept the duty watch awake (and in a good shape) during the night.