A SIMPLE DEVICE FOR OBSERVING BOTTOM CURRENTS

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Abstract from the *Bulletin de l'Institut Océanographique*, No. 1126, 15 September, Monaco.

A very simple device can be used either on an ordinary groundline fixed on the sea-bed beneath a buoy, or in a sort of cage lowered from a drifting ship, to make easily-repeatable single measurements of bottom current. The result obtained relates both to speed and direction.

The extremely simple instrument which can function at any depth is so sensitive that current speeds of 1/10-knot and less are measurable with certainty. The method consists in placing on the sea bottom a polythene tube which is one-metre long, 10 cm wide, and 6.3 mm in wall thickness. In this tube is placed a small glass bottle filled half with hot gelatine solution and half with coloured vegetable. (Fig. 1).

When this bottle is hot and the gelatine solution is therefore liquid, it is possible for a magnetized ceramic disc which is suspended from a nylon thread to turn freely and resolutely into the magnetic meridian. If the bottle be chilled whilst canted from the vertical, a sloping interface between the two liquids is preserved.

The polythene tube is closed at its base by means of a sealed-in plug from the centre of which a short cord hangs externally. This cord is fastened to an anchor weight such that when submerged in motionless water, the polythene tube (which is just and only just buoyant) stands perfectly erect. Any current causes it to lean from the vertical at an angle which is interpretable into current speed on reference to a calibration curve built up from tests made in a circulating water channel.

Before use the bottle is heated by immersion in a can of hot water and is then fixed in the tube. The latter is then filled with hot water and its mouth closed by means of a rubber capping held on by stretched rubber bands. This ensures that the jelly in the bottle is still liquid when the bottom is reached. When used tethered down to a groundline the tube remains closed and is not raised until enough time has been allowed for its contained water and bottle to chill. (Fig. 2).

When used from a drifting ship in a cage lowered on the standard hydrographical wire to just above bottom, a messenger is sent down the suspension wire. This causes the tube to jump out of the cage and to anchor itself. In doing so the rubber capping is snatched off thereby

permitting escape of the warm water from the tube and ensuring quick chilling of the bottle in consequence. In this method of use the tube cannot be dragged by the drifting ship before the gelatine solution congeals because a long length of strong thin flexible wire has first to be pulled off from a free-running light drum located in the cage.

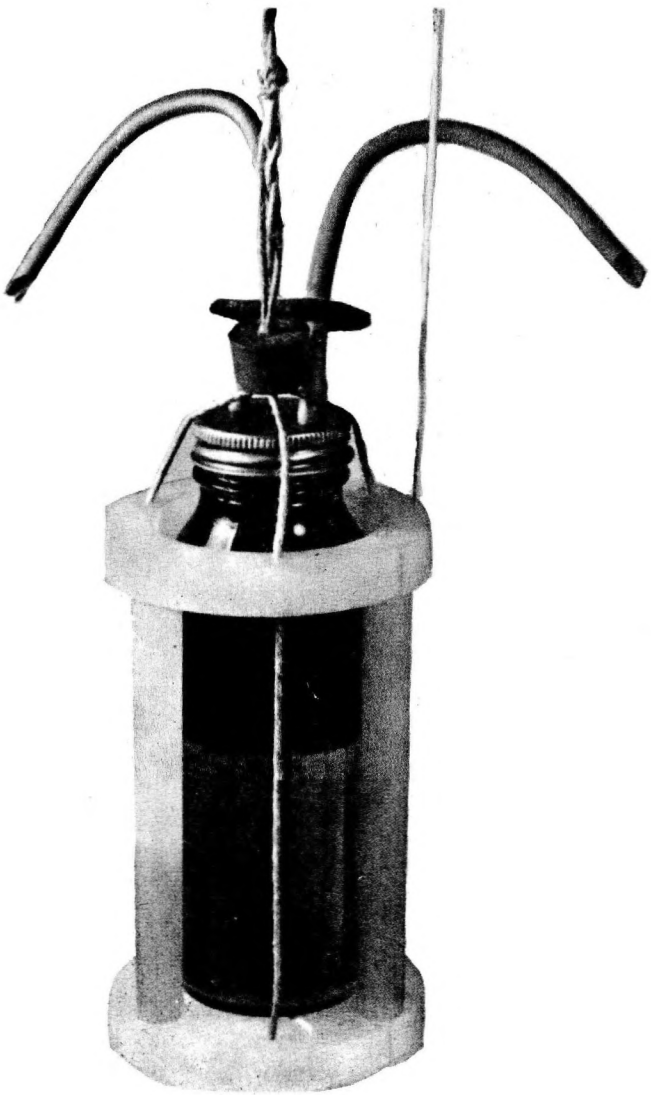

FIGURE 1
A jelly/oil bottle as ready for use if hot

Very successful use has been made of the simple instrument in Arctic waters by employing it in both of the ways just described, and also just below the surface of the sea under rough weather conditions and above more than a mile depth of water.

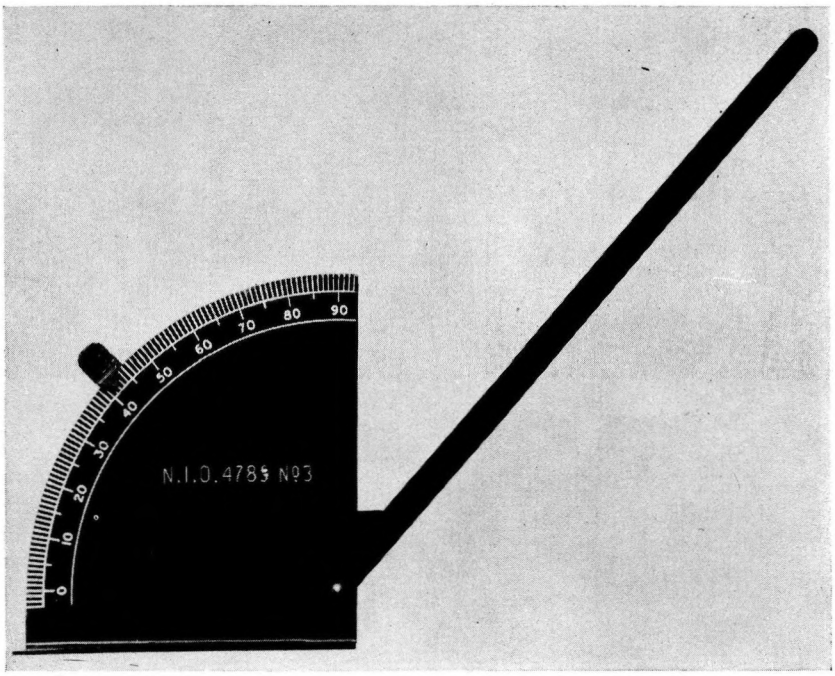

FIGURE 2
The angle-measurer used to measure the jelly slopes