

The ordinary deep-sea lead is a prismatic leaden block about two feet in length and 80 to 120 lbs. in weight, narrowing somewhat towards the upper end, where it is furnished with a stout iron ring. Before heaving, the lead is 'armed,' that is to say the lower end, which is slightly cupped, is covered with a thick coating of soft tallow. If the lead reach the bottom it brings up evidence of its having done so in a sample sticking to the tallow. Usually there is enough to indicate roughly the nature of the ground, and it is on the evidence of samples thus brought up on the 'arming' of the lead that our charts note 'mud,' 'shells,' 'gravel,' 'ooze,' or 'sand,' or a combination of these, as the kind of bottom at the particular sounding; thus we have  $\text{m. sh. s.},^{2,000}$  mud, shells, and sand at 2,000 fathoms;  $\text{oz. st.},^{2,050}$  ooze and stones at 2,050 fathoms;  $\text{m. s. sh. sc.},^{2,200}$  mud, sand, shells, and scoriæ at 2,200 fathoms, and so on.

When no bottom is found, that is to say, when there is no arrest to the running out of the line and nothing on the 'arming' of the lead, the sounding is entered on the chart thus,  $\text{s.},^{3,200}$  no bottom at 3,200 fathoms. Such soundings are not to be depended upon in deep water, but they are usually quite reliable for moderate depths, so far as they go. They give us no help in the exploration of the bottom of the sea, but they are of great practical value, and indeed they give all the information which is directly required for the purposes of navigation; for if there be 'no bottom' at 200 fathoms, there is probably no dangerous shoal in the immediate neighbourhood.

Soundings are usually taken from the vessel, and while there is some way on. Where great accuracy