

In this case the timing was only valuable as corroborating other evidence of the accuracy of the sounding, for even at this great depth, nearly three miles, the shock of the arrest of the weight at the bottom was distinctly perceptible to the commander, who passed the line through his hand during the descent. This was probably the deepest sounding which had been taken up to that time which was perfectly reliable. It was taken under unusually favourable conditions of weather, with the most perfect appliances, and with consummate skill. The whole time occupied in descent was 33 minutes 35 seconds; and in heaving up, 2 hours 2 minutes. The cylinder of the sounding apparatus came up filled with fine grey Atlantic ooze, containing a considerable proportion of fresh shells of *Globigerina*. The two Miller-Casella thermometers registered a minimum temperature of 2°·5 C.

Various attempts have been made to devise an instrument which should determine accurately the amount of vertical descent of the lead by self-registering machinery. The most successful apparatus for this purpose, and the one most in use is 'Massey's sounding-machine.' This instrument, in its latest and most improved form, to be used with the common lead, is shown in Fig. 43. Two thimbles FF pass through the two ends of the heavy oval brass shield AA; to the upper of these the sounding-line is attached, and to the lower the weight at about half a fathom from the machine. A set of four brass vanes or wings B are soldered obliquely to an axis in such a position that as the machine descends the axis revolves by the pressure of the water against