the ship was stopped to sound and obtain temperatures, and a good set of observations of the sun were taken at 6.40 A.M., and as its bearing was E. 6° N. (true), a considerable error in the latitude was of but little consequence to the resulting longitude. From these observations it appeared that from noon on the 30th April to 6 A.M. on the 1st May, when the sudden increase of surface temperature took place, little if any current had been experienced, the longitude from Dead Reckoning being 72° 8′ W., and that by observation 72° 4′ W. This result was also confirmed by an observation at 4.40 P.M. on the 30th April, the longitude by chronometer at that time agreeing with the D.R. longitude.

At 6 A.M. on the 1st May the wind was from the N.E., force 3 to 4, with a considerable swell, and owing to the rise of surface temperature to 75°·0, the opinion was formed that the vessel was in the Gulf Stream. In sounding the sinkers were lowered over the side of the ship without, as usual, keeping head to wind. When 250 fathoms of line were out, it trended rapidly to the W.S.W., and made it necessary to put the ship before the wind to keep exactly over the descending weights; in fact, the vessel had to steam W.S.W. (S. 60° W., true), at the rate of 3 miles per hour, to keep the line perpendicular, and even then could only do so by constantly checking, as when it was allowed to run out freely the surface drift of 3 miles per hour carried the bight rapidly astern. It will, therefore, be readily understood that the speed of the line as it ran out over the ship's side was the speed of descent of the sinker plus the rate at which it was being carried away by the current, and that, therefore, the time intervals were of little value in determining the moment at which the weights struck the bottom. When 2600 fathoms were out, the line was checked and was apparently perpendicular; but as the accumulators showed what was believed to be a decrease in the strain, and the line did not readily come up and down, it was concluded the bottom had been reached. This was a mistake, for on being hove up, it was found that the sinkers had not disengaged, nor was there any sign of mud on the rod.

A serial temperature observation obtained at this position showed that the warm water was quite superficial; at 60 fathoms the temperature was 71°, at 80 fathoms 68°, at 100 fathoms 65°, and at 125 fathoms 57°. To obtain these results a weight of 2 cwt. had to be attached to the bottom of the line to keep it perpendicular; with a less weight the bight of the line was carried away, forming a bow.

With the current drag lowered to a depth of 100 fathoms a very slight motion of the surface water past the watch buoy was apparent, but when lowered to a depth of 250 fathoms the surface water ran past the watch buoy at the rate of $1\frac{3}{4}$ miles per hour. It is therefore probable that at that depth, even if not at a less, the current drag was in still water, as the force of the 3-knot stream on the watch buoy and the upper portion of the current line was, probably, sufficient to move the drag through the water at about the rate of a mile per hour.

In investigating the strength and direction of ocean currents, such as the Gulf