

reaching its minimum at 4 A.M. on the 4th (29.48 inches), then rising quickly, with a freshening wind from the northeastward.

On the 4th, at 7.30 A.M. the mist cleared, the weather became quite bright, and the land about Matoya was distinguished; astronomical observations were also obtained by which it was ascertained that no current whatever had been experienced since passing Hino Misaki. At 4 P.M., the weather being very fine and calm, a sounding in 565 fathoms, serial temperatures, and a most successful and productive trawling were taken in lat. $34^{\circ} 7' N.$, long. $138^{\circ} 0' E.$, and again no current was found running (see Sheet 35). At 7.30 P.M. the vessel proceeded under steam towards Rock Island.

On the 5th June at 8 A.M. Rock Island lighthouse was passed, and at 1 P.M. a sounding, trawling, and temperatures were taken in depths varying from 775 to 420 fathoms over rocky uneven ground, with the left extremity of Vries Island S. $9^{\circ} W.$, the right extremity of Vries Island S. $32^{\circ} W.$, and Tree Hill N. $42^{\circ} W.$ Considerable difficulty was experienced in recovering the trawl, owing to the rocky nature of the bottom, but eventually it was hove to the surface at 5 P.M. much torn and containing a few stones, after which the ship proceeded for Yokohama, anchoring there at 9 P.M.

The Japan Stream or Kuro Siwo.—The Challenger's observations show that on approaching Japan a belt of water which was running to the northeastward at the rate of three miles per hour was passed through between lat. $32^{\circ} 30' N.$ and $33^{\circ} 30' N.$, on the meridian of $138^{\circ} 25' E.$ from Greenwich. On the southern edge of this belt the stream had a more northerly, and on its northern edge a more easterly, tendency than N.E. When to the northward of this belt of rapidly moving water a set of one mile per hour was experienced.

When in the current the temperature of the surface water varied from 63° to 68° , changing suddenly from the one temperature to the other, giving alternate streams of cold and warm water without any alteration in its rapidity being detected. That this was the case is readily proved by the observations from 7 A.M. to 10 P.M. on the 10th April, which, though taken at different times, all agreed in showing a steady set of three miles per hour, although the temperature of the sea changed suddenly at 1 P.M. from 68° to 64° , and at 7 P.M. from 63° to 68° .

In the month of May a moderate set to the eastward was experienced close to the south coast of Nipon Island. In June there was no current at a distance of 30 to 40 miles from that coast, but to the southeastward of Nipon a stream was found running to the northward at the rate of two miles per hour of the mean temperature of $72^{\circ}.5$.

The rapid stream of alternate belts of warm and cold water south of Nipon Island probably originates in the following manner:—The northern Equatorial Current striking against the eastern side of the Philippine Islands is, as is well known, diverted to the northward, along the eastern side of Formosa, after passing which, it appears gradually