

was of the same description as we afterwards experienced in other similar cases, namely, an increase. We thus have a fact to aid in proving that the opinion generally entertained, that on coming into soundings, or near islands, the temperature always falls, is not correct. I am of opinion that this diminution only takes place where polar streams prevail, and particularly if they be submarine. The obstruction throws their waters upward, and mingles them with those at the surface, which causes the low temperature. It would therefore seem as if the existence of polar currents may be shown by a fall of temperature on coming within soundings, and that when this does not occur, it may be assumed as certain, that no polar current prevails in the neighbourhood.

Between the Society Islands and the Samoan Group, it may be said that there are no currents. The distance is about two thousand miles, and our passage occupied fourteen days, during which time the whole amount of drift was forty-three miles in a direction N. 9° W.

On approaching the latter group, the temperature of the water rose a few degrees, indicating, according to the view I have already taken, that there was no submarine cold current.

Around the Samoan Group a current appeared to revolve; for on the southern side it set continually eastward, while on the northern side it set to the west. This current is weakest near the shores, and is not fully developed until at some distance from the islands. This phenomenon has little connexion with the tides, and does not appear to be connected with the general system: at least I have been unable to account for it on general principles. A knowledge of its existence is however of importance to the navigator, as advantage may be taken of the easterly direction of that part to the south of the islands, in beating to windward.

On leaving the Samoan Islands for Sydney, and passing to the westward of the Feejee Group, a current was found setting to the southwest, and this prevails beyond the latter islands.

As we approached Lord Howe's Island and Bell's Pyramid, we met a current setting north, in which direction our drift on the passage to Sydney was one hundred and twenty miles. In the neighbourhood of the first-named island, the temperature of the water fell to 66°. After this, however, and before making the coast of New South Wales, the temperature of the water rose to 73°, and we experienced the effects of a stream that sets to the southward parallel to the coast of New Holland. This current, like the Gulf Stream, is variable in breadth and strength, and at certain seasons of the year runs with great rapidity. The occurrence of this stream renders it advisable that