

as Cook's Straits. The current which flows on the eastern side, forms an eddy to the north of the islands.

We must here note, although we did not ourselves enter it, the polar stream which sets upon Cape Leeuwin, the southwestern promontory of New Holland. According to Captain Flinders, whose statement is corroborated by French authorities, this stream appears to be divided at the cape; and both of these branches were found to set with great velocity for a short distance to the north and east of that cape. The branch that sets eastward along the southern coast of New Holland, has at first a velocity of as much as twenty-seven miles in twenty-four hours; the other branch, setting north, has a velocity of from twenty to thirty miles. All authorities agree that both of these velocities are rapidly diminished, and at times the eastern branch is felt feebly beyond Bass's Straits. The northern branch follows a line parallel to the coast, and on reaching the north coast of New Holland, is deflected again, and flows off to the northward and westward.

On our return to Sydney from the Antarctic cruise, we again encountered the warm stream; and being now aware of its existence, I was able so to shape the course of the vessel as to pass out and into it again as we ran up the coast. The temperature of its waters was found to be 75° .

In crossing from Sydney to New Zealand, on leaving the coast the same current was found to exist, both by the temperature and the drift of the ship. We also passed over what is called by the whalers, the Middle Ground, and while we were in it no current was found to prevail, a circumstance to which I shall have occasion to refer hereafter.

Between New Zealand and Tonga the currents were variable, and their general effect was a drift of one hundred and eight miles in a direction $S. 88^{\circ} W.$ On this route we passed the Kermadec Islands, and through the latitudes where the southern polar streams seem to be lost.

On leaving Tonga, we soon met with the current existing among the Feejee Islands. This current sets through the eastern range of these islands to the northeast, as observed by the Porpoise during her survey of that portion of the group, and as shown by the manner in which the casks of the whale-ship *Shylock*, wrecked on Turtle Island, were carried to Fulanga, where they were picked up. We also experienced the same current in the drift it caused on the first night of our arrival off these islands. A strong current also sets to the eastward, on the southern side of the Feejee Group. I had here to regret the loss of our deep-sea sounding apparatus, the importance of which in