

proved the extension of the Gulf Stream to the west coast of Nova Zembla, and that we find it on the meridian of Kanln Noss ($43\frac{1}{2}^{\circ}$ east) still of a width equal to two degrees of latitude, and of temperature of 54° , cooling down at depths of thirty and fifty fathoms, only four to six degrees.'''*

THE KARA SEA

was explored by a small sailing vessel, and found free of ice. Nova Zembla was also found to extend farther north than usually represented on maps, reaching latitude $77^{\circ} 8'$ north. Captain Johannesen found Norwegian glass balls at the Northern extremity of Nova Zembla, and, as Dr. Petermann says, "by this fact alone, the existence of the Gulf Stream is for the first time shown to reach even these remote shores, as they have not been visited by a civilized seaman since 1594, by a Dutchman named Barentz." "By these reports, it is shown that our knowledge of the polar regions has been much forwarded during the past year, and extensive coast lines on east Greenland, east Spitzbergen, east and north Nova Zembla, have been proven accessible; as, also, a wide range of the high sea has been found navigable, which had heretofore been considered inaccessible on account of being filled with ice."

DR. PETERMANN'S MAP

of the extension of the Gulf Stream represents the northern edge of that stream in summer as passing to the west and north of Iceland; thence east along the parallel of 68° to about 3° west longitude, whence it curves sharply northward to 75° north, and then a little eastwardly to latitude $81^{\circ} 40'$, in longitude 3° east, where it is blocked by ice. The remainder interdigitates with the polar current, running down on the east side of Spitzbergen, and with its north edge crosses the parallel of 75° , in longitude 24° east, and which terminates on the meridian of 30° east in longitude 77° north, where this branch remains unfinished for the want, I suppose, of observations. The eastern branch he makes extend from its separation from this last named one, in latitude $75^{\circ} 10'$, longitude 37° east, eastwardly to Nova Zembla, in latitude 75° , enveloping all the west side of that island to the southward of that point, the northwest coast of Russia, the White Sea, and Lapland. In other words, it has no unity of flow; but I expect that this outline is made from surface temperatures, and represents superficial drifts of warm water from the main stream, which latter most likely flows in uniform volume in a given path northward, between Spitzbergen and Nova Zembla, somewhat as I have here represented it.

PETERMANN'S SECOND EXPEDITION.

I sent my pamphlet to Dr. Petermann in the spring of 1869. In the following June he started his second North Pole expedition, consisting

* The two foregoing paragraphs are taken from the Hydrographic Office translation.