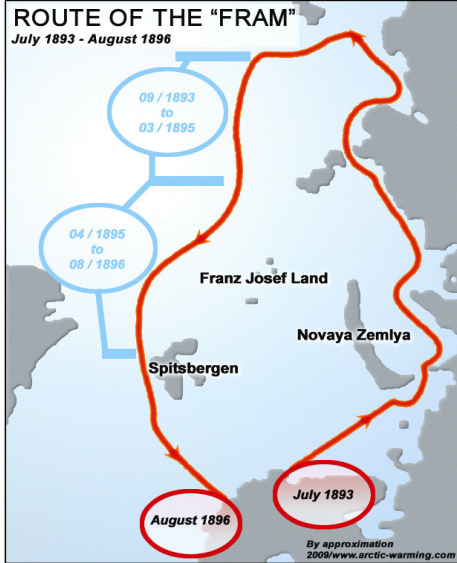


1928

Fridtjof Nansen – 1928
The Oceanographic Problems of the Still unknown Arctic Region¹
 Extract from section: Circulation of the Water

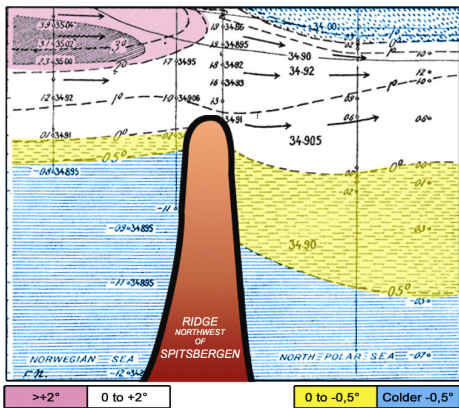


A methodical study of the water layers and their movements in the still unknown regions of the North Polar Sea will be of much interest. As was discovered during the FRAM expedition of 1893 – 1896, this sea is covered by a layer, 150 to 200 meters thick, of cold water with temperatures between 0°C and -1,9°C and a comparatively low salinity owing to the admixture of fresh water, chiefly river water from Siberia, Alaska, and Canada. Below this surface layer there is a layer, some 600 to 700 meters thick, of warmer and saltier water, with temperatures above 0°C. and salinities approaching 35 per mille. This is Atlantic water which is carried into the Arctic Basin chiefly by the small branch of the Atlantic Current (“Gulf Stream”) running northwards along the west coast of Spitsbergen. Below this warmer water there is again colder water filling probably the whole basin to the bottom; its temperatures between 0°C. and -0,8°C and its salinity 34.90 per mille. This cold deep-water originates in the northern part of the Norwegian Sea, north-northeast of Jan Mayen, where it sinks down from the surface, which is cooled by the radiation of heat during the winter and spring. The thus cooled water runs into the Arctic Basin across the probable submarine ridge between Spitsbergen and Greenland. A study of the condition of these various water layers and their distribution in the various parts of the North Polar Sea would be of much value.



While we drifted with the FRAM across the Arctic Basin our deep-sea observations showed that the boundaries between the water layers, especially between the cold surface layer and the warmer underlying water, were subjected to considerable vertical oscillations. By later observations we have found that such vertical oscillations, due to surface boundary waves, often of very considerable dimensions, probably are quite common phenomena in the ocean; but they have not yet been sufficiently studied methodically. From the drifting ice movements of the water – the horizontal currents as well as these vertical oscillations of the layers – may be continually and carefully studied at all depths in an ideal manner which is not possible in the open ocean; and many of the greatest problems of oceanography may thus be solved.

Fridtjof Nansen - 1928
 "The Oceanographic Problems of the still unknown Arctic regions"
 in W.L.G. Joerg(ed); Problems of Polar Research, American Geographical Society, No. 7



Atlantic water running over the ridge off Spitsbergen into the Arctic Ocean

¹ Nansen, Fridtjof (1928); in Joerg, W.L.G. (ed): Problems of Polar Research, American Geographical Society, Special Publication No. 7, p.3 ff