

1936

Schokalsky, J. (1936)¹ ;

**"Recent Russian researches in the Arctic Sea
and the in mountains of Central Asia",**

in: The Scottish Geographical Magazine, Vol. 52, No.2, March 1936, p. 73-84.



Extract from the paper:

___ This work (of Russian scientists and institutions) was necessary in order to ascertain the temperature of the Atlantic branch of the Gulf Stream west of Spitsbergen, and to know what temperatures conditions may be expected along the Eurasian continental slope of the North Polar Ocean.

___ During the memorable voyage of the FRAM (1893-1896), Nansen discovered that the upper layer of the Arctic Ocean from 200 to 500 metres in thickness was less saline than the deeper water, and that it had a temperature of $-1,0^{\circ}$ to $-1,9^{\circ}$ C, while the deeper layer, from 600 to 700 metres tick, was of oceanic salinity (over 35 per cent.), and had a temperature of $+1,2^{\circ}$ C.

----- Five years later, S.O. Makazov, on the ice-breaker ERMAK, between Franz Josef Land and Novaya Zemlya, found that the zero temperature occurred at a depth of about 200 metres, and that below this the temperatures rose to $+1,1^{\circ}$ C. This confirmed Nansen's observations.

----- In 1927 the ship ELDING, between Franz Josef Land and Novaya Zemlya, recorded temperatures of $+0,6^{\circ}$ C at 100 metres depth. Then, in 1928, the KRASSIN'S observation north of Spitsbergen in lat. $81^{\circ}47'N$ revealed a new fact. At 70 metres the water was found to have oceanic salinity of over 35 per cent and a temperature of $-4,6^{\circ}$ C.

----- Sverdrup's observations in the NAUTILUS in 1928 confirmed these facts for latitude $82^{\circ}N$. In 1929 the SEDOV and the PERSÉE, at almost the same place Makazov chose for his observation in 1901, found the zero isotherm to occur at the depth of 125 metres instead of 200 metres. ----- Again, in 1931, the PERSÉE, in the same vicinity, found this thermobath at 75 metres, and the LOMOHOSOV, a little farther east, found it from 25 to 40 metres, below which depth the temperature increased to $+1,6^{\circ}$ C. (cont.)

----- And finally the PERSÉE in 1934 reaching $81^{\circ}17'N$, north of Spitsbergen, early in September, recorded an air temperature of 12° C and a sea temperature of $+5,5^{\circ}$ C down to 10 metres.

___ The branch of the North Atlantic Current which enters it by way of the edge of the continental shelf around Spitsbergen has evidently been increased in volume, and has introduced a body of warm water so great, that the surface layer of cold water which was 200 metres thick in Nansen's time, has now been reduced to less than 100 metres in thickness.

___ These records, and others not cited here, together provide incontestable evidence of a progressive warming of the Arctic Ocean.

___ For this purpose, it is necessary to know more about the thermal conditions of the branch of the Atlantic Current which passes round Spitsbergen.

NOTE: In 1953 H.W. Ahlmann provided the information: The thickness of the ice forming annually in the North Polar Sea has diminished from an average of 365 cm at the time of Nansen's Fram expedition of 1893- 96 to 218 cm during the drift of the Russian icebreaker Sedov in 1937-40. (Ahlmann, 1953).

¹ Professor Jules Schokalsky , President of the Geographical Society of the Soviet Union. A paper read before the Royal Scottish Geographical Society in Edinburgh on the 30th January 1935, on the occasion of the presentation to Prof. Schokalsky of the Society's Research Medal.