

The influences of congelation too, aided by the diminished intensity and the withdrawal of the solar ray, increase the atmospheric precipitation, and probably diminish the compensating evaporation. Yet this position calls for further investigation to establish it absolutely; for recent experiments show that even in the dark hours of winter, and at temperatures of fifty degrees below zero, evaporation goes on at a rapid rate. That it holds, however, in general terms, is evident from the inferior specific gravity of the Arctic waters. They are less salt than those of more equatorial regions. Their average specific gravity (1.0265) indicates about 3.60 per cent. of saline matter.

The atmospheric precipitation extending to the adjacent land slopes, the melting of the snows and accumulated glacial material, and the floods of the great Siberian rivers, are sufficient to account for this.

With such sources of supply, it is evident that this surcharged basin must have an outlet, and its contents a movement independent of the laws of currents generally operative, which would determine them toward the equator.

The avenues of entrance to and egress from the polar basin are but three; Behring's Straits, the estuaries of Hudson's and Baffin's Bays, and the interval between Greenland and Norway, upon the Atlantic Ocean, known as the Greenland Sea. In Behring's Straits, it is probable, from imperfect observations, that the surface current sets during a large portion of the year from the Pacific into the Arctic Sea, with a velocity varying from one to two and a half knots an hour. Neither the soundings nor the diameter of this strait indicate any very large deep-sea discharge in the other direction.

The Gulf Stream, after dividing the Labrador current, has been traced by Professor Dove to the upper regions of Nova Zembla; so that Baffin's Bay, and the Hudson, and Greenland Seas, constitute the only uniform outlet to the polar basin.

It is by these avenues, then, that the enormous masses of floating ice, with the deeply-immersed bergs, and the still deeper belt of colder water, are conveyed outward. Underlying the Gulf Stream, whose waters it is estimated at least to equal in volume, the vast submerged icy river flows southward to the regions of the Caribbean. The recent labors of the United States Coast Survey and Nautical Observatory have, as the society is aware, developed and confirmed the previously-broached idea of a compensating system of polar and tropical currents; and we are prepared to consider these colder streams as equalizers to the heated areas of the tropical latitudes, and analogous in cause and effect to the recognized course of the atmospheric currents.

In fact, Dove, Berghaus, and Petermann, three authorities entitled to the highest respect, recognize for the Arctic Ocean a system of revolving currents, whose direction during summer is from north to south, and during winter the reverse, or from the south to the north. The isotherms of Lieutenant Maury (projected by Professor Flye) point clearly to the same interesting result. Contrasting these great movements of discharge and supply with the surface actions, we find during the summer months a movement along the northern coasts of Russia, clearly from east to west, from Nova Zembla westwardly and south-westwardly to Spitzbergen, where, after an obscure bifurcation, it is met by a great drift from the north, and carried along the coast of Greenland, in a large body known as the East Greenland current. The observations collected by Lieutenant Commanding De Haven show that this stream is deflected around