

On his outward voyage, Lenz's course lay farther to the eastward than that of the Challenger, and, consequently, he did not observe the same high specific gravity. From the 40th to the 18th parallels his observations show a very constant mean specific gravity of 1.0270. In the centre the two sets of observations agree very closely, and in the west there is only the one.

A comparatively high density prevails in the Atlantic up to very high northern latitudes. The Norwegians in their expeditions of 1876-1878 found the water of the sea surface to have a very uniform density of 1.0262 to 1.0264 up to latitude 75° N. Farther to the west this warm salt water is displaced by the cold fresh water coming down from polar regions and creeping along the American shore as the so-called "cold wall" down to comparatively low latitudes. The waters of the Gulf Stream belong to the warm and salt waters of the Atlantic; consequently, when it is entered from the west or south, no apparent or marked change is observed in the colour, temperature, or saltness of the water. When, however, it is approached from the other side, as by ships leaving American ports, the change is very marked from the green, turbid, cold, and fresh polar waters of the "cold wall" to the transparent deep blue waters of the warmer ocean. The Gulf Stream was crossed twice by the Challenger, once off Sandy Hook and the second time off Halifax. The specific gravity on the latter occasion was 1.0271, which is identical with the mean specific gravity of the water derived from all the observations made between St. Thomas, Bermuda, and the Azores.

What is most remarkable on approaching or leaving the Atlantic shores of North America is not the warm blue water in more or less rapid motion in a northeasterly direction, which does not materially differ from the water of the Atlantic farther to seaward, but the green cold polar water which intrudes itself down along the coast and has such a powerful influence on the climate of the eastern States of America. On the other hand, by following the direction of the green zone on the Chart, it will be seen that the warm and dense water of the Atlantic penetrates far into Arctic regions in the direction of Spitzbergen, where it in its turn may be held to be an intruder, but a beneficent one. It fills the whole of the deep basin of the Norwegian Sea with dense Atlantic water, thrusting the Arctic water farther into polar regions, from whence it overflows down the east coast of Greenland and the western side of Davis Strait. It is the open character of the sea, that is, the freedom from large masses of land, that enables the water to get away towards the polar regions in the direction of Spitzbergen, and thus to benefit the countries which, like Great Britain, are situated on the edge of the stream or drift. On the other hand, the supply of warm water is much increased, as pointed out by Mr. Croll, by the configuration of the American continent, which diverts a large portion of the water impelled by the southeast trade winds into the North Atlantic, so that with an excessive supply of warm water and a ready means of getting rid of it, the circulation in it is active and far reaching.