

Were it not for the operation of the law on which the latter phenomenon depends, the entire ocean would long since have become solidified, and both sea and land rendered unfit for the habitation of living organisms. Unlike other bodies which expand and become lighter with every rise in temperature, water attains its maximum density, not under the lowest degree of cold, but at $39^{\circ}\cdot 5$ Fahrenheit; and consequently so soon as the superficial layer of sea is cooled down to this degree, it descends, and allows a fresh portion to ascend and be in turn cooled. This process is continued until the whole upper stratum is reduced in temperature to $39^{\circ}\cdot 5$, when, instead of contracting further, it begins to expand and get lighter than the water beneath, floats on it, becomes further cooled down, and at $28^{\circ}\cdot 5$ is converted into ice. . . . Thus under the operation of an apparently exceptional law, the equilibrium of the oceanic circulation is maintained; for whilst at the equator the mean temperature of the surface layer of water, which is 82° , gradually decreases, until at a depth of 1,200 fathoms it becomes stationary at $39^{\circ}\cdot 5$, and retains that temperature to the bottom, within the Polar regions and extending to lat. $56^{\circ} 25'$ in either hemisphere, the temperature increases from the surface downwards to the isothermal line, beyond which it remains uniform as in the former case. Hence in lat. $56^{\circ} 25'$ the temperature is uniform the whole way from the surface to the bottom; and as has been found by observation about lat. 70° , the isothermal line occurs at 750 fathoms below the surface.”¹

¹ Dr. Wallich : North Atlantic Sea-bed, p. 99.